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THEORY AND RESEARCH

in Social Education

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Summer 1986

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**College and University
Faculty Assembly**

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The Social Studies Component of the Southern Literacy Campaign: 1915-1930

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Tennessee Technological University

Abstract

Social studies aspects of the southern literacy campaign of 1915-1930 are examined. Special adult schools dedicated to instruction in reading and writing frequently attempted to meet simple goals of civic education. Relevant topics included the assumed link between literacy and crime, patriotic goals related to support of our role in World War I, support for public works such as road construction, personal values such as thrift and cleanliness, and general knowledge of history and geography. Texts and instructional methods which now seem quaint nevertheless have some striking similarities to current practice.

This paper identifies the extent of southern illiteracy in the twentieth century and examines social studies components grafted onto the literacy campaign's primary mission of teaching adults to read and write. The southern literacy campaign provides historical evidence of the ease with which social studies content mixes with conceptions of citizenship. Pursued with the greatest vigor from 1915-1930, this campaign sought to impart knowledge, attitudes, and skills designed to help black and white adult illiterates function successfully in a modernized southern culture. Overtly geared to the teaching of reading and writing skills, the southern literacy campaign incorporated a haphazard social studies component which blended content with a view of citizenship surprisingly consistent with some contemporary thought. The manner in which the social studies component meshed with the goals of this campaign provides sobering evidence for those persons wishing to alter fundamental orientations within the social studies profession. The experience of the southern literacy campaign may imply that conceptions of citizenship education based upon alternative models, higher order thinking skills, and more sophisticated value commitments may prove harder to achieve than one might wish (Shaver, 1977; Branson & Torney-Purta, 1982).

Southern Illiteracy: The Early Twentieth Century

Ten years into the twentieth century southern states exhibited a substantial, if not staggering, illiteracy rate among blacks and whites. Based on county averages, total illiteracy rates in 1910 ranged from 12.6% in Arkansas to 34.3% in Louisiana for persons over 10 years of age. White illiteracy ranged from 4.5% in Mississippi to 14.1% in Louisiana. Black illiteracy ranged from 21.5% in Arkansas to 51.4% in Louisiana. Most significantly, illiteracy distributed itself unequally according to age. The older the person, the higher the illiteracy rate. Thus, blacks over 65 years of age had an 81% illiteracy rate and 20% of whites over 65 years of age were illiterate (Bureau of the Census, 1913a, 1913b).

The solution to the problem of adult illiteracy in southern states came in the form of an evangelistic crusade designed to raise public awareness and support for special adult schools devoted to teaching basic reading and writing skills. Most frequently called Opportunity Schools or Moonlight Schools, the majority of adult literacy schools took place in the evening or during July and August after crops had been laid-by. During the lay-by season Opportunity Schools met four hours each day during the six-week period. Teachers provided basic instruction in literacy skills as well as a variety of enrichment lessons for literate adults who attended due to lack of recreational alternatives (E. Alford & G. Alford, personal communication, December 16, 1982). The primary thrust, however, sought to develop reading, writing, and arithmetic skills. Other components received much less instructional time.

The southern literacy campaign caught fire in Kentucky and spread to other southern states after 1915. Never the truly systematic, comprehensive effort desired by its advocates, the campaign consisted of scattered efforts of varying scope, quality, and effectiveness. Alabama, Kentucky, and South Carolina developed the most consistent literacy campaigns and institutionalized them within the bureaucratic framework of their respective Departments of Education. The scope, mechanics, impact, and detailed structure of the southern literacy campaign merit separate attention and have been analyzed in other discussions (Akenson & Neufeldt, 1984, 1985).

Illiteracy and Citizenship

Conceived in patriotic fervor, citizenship represented a major concern of the southern literacy campaign from its inception. The proclamation of Alabama Governor Charles Henderson linked the need to eliminate illiteracy and promote modernization as "the people of Alabama look forward with pride upon her remarkable record and are moved with a passionate desire to promote her industrial, intellectual, and moral efficiency . . ." (Alabama Illiteracy Commission, 1915, p. 1). Duties of citizenship required "every literate man, woman, and child of every station, community, or

creed to consecrate himself to this stupendous, though surmountable work.” By making the illiterate adult literate a better Alabama citizen might emerge.

If in addition to learning to read and write, and perform operations in arithmetic, a person gains the power to read a newspaper, a farm journal, and the Bible, and has developed in him health and civic consciousness, he is well on the way toward a normal life. (Alabama Department of Education, 1919, p. 111)

Not only was it claimed that illiterates lacked the ability to function as citizens in a modern commerical, industrial South, but that illiterates engaged in crime. The Illiteracy Commission of South Carolina (no date a) linked crime and illiteracy in a causal relationship, asserting that:

Sentences of the 92 women prisoners in the State
Penitentiary equal 627 Years
For maintenance of these prisoners the state must spend \$121,000
41% of these are illiterate.
All 92 could have been educated through high school at cost of \$10,000
Therefore: Probably for the lack of education
the State will lose \$111,000

Cora Wilson Stewart, founder of the Kentucky literacy crusade, made the following argument in a report to the National Education Association:

In the most illiterate sections of the United States conditions approach the barbaric. Marriage has no sanctity whatever, and commerce is carried on through trade and barter, as when America was roamed over by savage Indians. In these densely illiterate communities the currency of the country is an unknown medium of exchange, neither silver, gold nor paper money being used anywhere is the locality. It is needless to add that in a section where even the currency of the country does not circulate, none of its progressive or helpful ideas can flow or will be adopted. (Stewart, 1923, p. 266)

Illiteracy thus became viewed as antithetical to good citizenship and to the needs of a modernized South. The southern literacy campaign included a social studies component designed to focus directly upon the knowledge, attitudes, and skills of good citizenship. Specific teaching materials, curriculum outlines, and experiences helped address the citizenship question.

Patriotism

Early in the southern literacy campaign the entry of the United States into World War I resulted in specific efforts to instill positive attitudes toward the war effort. Illiterate draftees constituted a danger due to their inability to read safety instructions and sanitary regulations. More importantly, literacy training could instill a patriotic attitude toward America's war

goals. The Alabama Illiteracy Commission reported that the illiterate draftee was:

. . . .a dangerous man in camp because of his low spirits, his poor morale. Cut off from any effective communication with home and friends, understanding little of the great events of the day and less of the purposes of the great nation at war; and with slight chance of promotion in the military profession, he was not likely to be a cheerful soldier. (Alabama Department of Education, 1918, p. 1)

Although illiterates willingly marched off to combat throughout the course of history, illiterates in 1917 posed a threat because of inefficiency and an inability to absorb the motivation need to engage in national defense. In a letter circulated throughout South Carolina, the Illiteracy Commission pleaded:

Our illiterate men are being drafted by the thousands and valuable time is taken from drilling and preparing for a war which is to save civilization and Christianity, to teach these men to read and write.

Russia's fall was caused by German propaganda among the ignorant classes. There is a fertile field for German propaganda in our state and as you know it is going on all about us. A great effort must be made to mobilize our illiterates and near illiterates into the night schools where they will be taught not only reading and writing but farming, industry, and patriotism. Will you do your part so that your county will keep pace with the rest? (Illiteracy Commission of South Carolina, no date b).

Development of curriculum materials and special literacy classes for draftees quickly found their way into the campaign.

At Camp Sheridan, Professor W. C. Blasingame of Alabama Polytechnic Institute directed a literacy program for native born and foreign born whites. Teachers for the draftees included some of the most cultured women of the state as well as female teachers from Montgomery who were transported by the Women's Motor Corps Division. Cora Wilson Stewart of Kentucky aided the war effort by producing a variety of materials including *Soldier's First Book*. Reading exercises reflected the patriotic theme as the young recruit read:

See the flag.

It is our flag.

Our flag never knew defeat!

Why did our flag never know defeat?

Because our flag has always stood for the right.

If the recruit needed a reason for defending his country, there existed appropriate passages supplying the needed rationale.

Why are we at war?
To keep our country free.
To keep other peoples free.
To make the world safe to live in.
To stop the rule of kings.
To put an end to war. (Stewart, 1918, pp. 6, 14)

Devotion to country meshed neatly with the remainder of perceived needs of the adult illiterates.

Following World War I, Cora Wilson Stewart made certain that specific social studies content focused upon the effects of the war effort upon the peace which followed. The *Moonlight School Course of Study, 1919* included geography drills and history drills. Geography drill No. 3 titled Development included the following:

(Q) What changes have taken place in the relative standing of various nations?

(A) Germany and her associates in the war have become discredited nations; Russia is at present in a disorganized, weakened condition; America has risen to a position of commanding importance as an arbiter of world affairs. (Stewart, 1919, p. 25)

The reason for America's commanding role in world affairs could be identified in history drill No. 3, How America Helped Save The World. Initial questions of the drill deal with when the war began, when America entered the war, and when the war ended. More important points also received attention:

(Q) Why did Germany quit?

(A) Because she began to see and feel the mightiness of America.

(Q) How did the power of America begin to show itself?

(A) We were making more field artillery, more shoulder rifles, more powder and more poisonous gas (and of a much more poisonous nature) than England and France together were making.

(Q) How did Germany know these things?

(A) She had 100,000 German spies in the United States, some of whom were sending information directly to Germany.

(Q) What is the task of America concerning these spies?

(A) To educate all of them we can into good citizens and drive the others from our shores.

(Q) Why did the Allies and America win?

(A) Because they were fighting a just cause against an unjust one. General Foch prayed to Jesus Christ and God while the Kaiser prayed to Woden and Thor. The Allies prayed for justice while the Germans prayed for plunder. (Stewart, 1919, p. 30)

Other drills stressed that America had given “the world complete toleration,” “equal political privileges to all,” and “civil privileges to all.” If victory in World War I left any doubt as to the mission of America, history drill No. 4 indicated that tasks included “making good citizens of all who are not so now,” providing the “right kind of education for all,” and carrying “democracy and liberty that we enjoy to the rest of the world.” Social studies thus helped motivate soldiers as well as explain the history and consequences of World War I. In addition, America had a national and international agenda, built around good citizenship, which shared the benefits of a democratic society.

Components of Good Citizenship

Social studies in the southern literacy campaign thus took on a mission geared to developing good citizens. Most significantly, citizenship fit within the perceived needs of southern states to develop commerce, agriculture, and industry to compete in the twentieth century. A basic set of attributes linked good citizenship to cleanliness, good manners, modern agriculture, literacy and arithmetic skills, Godliness, and increased governmental services. The cover of Kentucky Illiteracy Commission teaching materials (Stewart, 1918) depicted a Moonlight School to which the paths of thrift, better homes, good roads, health, and education converged. One assignment for Alabama Opportunity School teachers required students to:

Show how cooperation makes road buildings, health protection, good schools, church buildings possible. What does the Bible mean by ‘No man liveth unto himself?’ (Alabama Department of Education, 1930, p. 15)

Not surprisingly, the efforts of adult school teachers, the official course outlines, and specially produced supplementary materials manifested such dimensions of citizenship in the teaching of basic reading, writing, and computational skills. Alabama, Kentucky, and South Carolina included materials which stressed belief in the Bible as a component of citizenship.

Wil Lou Gray, director of the Division of Adult Education for the South Carolina State Department of Education, provides insight into the social studies component of the southern literacy campaign. As part of her masters degree at Teachers College, Columbia University, Gray wrote a supplementary civics text, *Elementary Studies in Civics*, a blend of attributes believed to constitute good citizenship: Good Manners, Health, Education, Budgeting, How to Invest Money, Our Government, How our Country Works for Us, What Our State Does for Us, and What Our National Government Does for Us (Gray, 1927, p. xi). Such chapter headings suggest that she saw good citizenship as including a variety of appropriate behaviors beyond mere knowledge of, and participation in, governmental processes.

Good manners for Gray started with the assertion that it is "thinking about the other fellow. It is obeying the Golden Rule." A series of examples provided adult students with an opportunity for discussion:

A girl had just finished a course in table manners. She had learned that she must never put her knife into her mouth. She had a guest for dinner. The guest ate with her knife and the girl laughed. Do you think that girl had good manners? Why not? (Gray, 1927, p. 1)

Throughout the text adults learned about coughing in handkerchiefs, germs, vaccinations, the need for education, budgeting skills, the budgets of Mr. Tightwad, Mr. Spendthrift, and Mr. Thrifty, and methods of investing. The first 27 pages focused directly upon the various aspects of local, state, and national government.

This section, Our Government—What It Is and What It Does for Us, introduced adult South Carolinians to the need for government. Gray began by dealing with the concept of dependence (interdependence in contemporary social studies language). A listing of food, clothing, roads, lights, and other items to a series of questions followed by a series of points regarding dependence.

. . . It may be that you are depending on the labors of someone in another state or even in some far off land across the ocean. Have you ever thought how many people aid in giving you your cup of coffee? (Gray, 1927, p. 29)

The laborers in the foreign country, the wholesale company, government regulation, salespeople, bankers and store clerks all receive mention to make the point of dependence. Subsequently, the text pointed out difficulties if each individual attempted to make one's own laws, build roads, coin money, and punish criminals. According to Gray it would be "a case of everybody for himself and the devil take the hindmost." Government provided for the common good. Throughout the remainder of the text specific topics deal with local, state, and national government.

Elementary Studies in Civics (1927) received praise from businessmen and professionals throughout the United States. One review by the Florida State College for Women librarian stated:

Miss Wil Lou Gray in her *Elementary Studies in Civics* has given education and citizenship in South Carolina an outline which, if followed, will go far toward making progress in our state an easy matter. Her straight forward questions are veritable searchlights turned on every voter, prospective and real and on every office holder in South Carolina. For example, take the questions . . . "Have you every known an officer, sworn to obey the laws of the land, arrest one man for having a pint of whiskey and yet take a drink with another man? Do you call that law abiding? Did you help elect these men?"

Make these questions personal ones and see just how far so-called “good” citizens are to blame for regrettable conditions about which we complain. These and scores of other especially pertinent questions are certainly thought provoking and if men and women who form the citizenship of South Carolina can be helped and inspired to think, happier homes, better schools and a noble state are realities of the near future. (Richardson, 1927)

Gray could hardly be considered an extreme liberal by contemporary standards or those of her own time. However, the following example and questions evince a concern for evenhanded justice set within the parameters of racial segregation.

Have you ever known an officer to arrest a group of Negroes for shooting craps and failed to see some of his friends playing poker? Is that right? (Gray, 1927, p. 48)

Used in the special black and white Opportunity Schools held during the summer and in the adult night school program throughout the year, Gray’s civics text helped provide adults with social studies lessons with a particular notion of citizenship. The frequency of use, however, cannot be determined given available data. Given the literacy campaign’s primary emphasis on basic literacy and a wide variation between individual county and city adult programs, the use of *Elementary Studies in Civics* was inconsistent.

Within *Elementary Studies in Civics* and within Cora Wilson Stewart’s *Country Life Readers* (1915, 1917) stood lessons to alter student attitudes toward the role of government and the need for taxation to improve the quality of life. In Stewart’s *Country Life Reader, First Book* (1915, p. 10), the adult read a passage beneath a drawing of a two-lane highway flanked by well maintained shoulders and power lines running on either side.

This is a road.
It is a good road.
It will save my team.
It will save my wagon.
The good road is my friend.
I will work for the good road.

In contrast, the following page pictured a muddy, shoulderless road, over which a team of horses labored to pull a buggy. The passage stated:

See this bad road!
It will waste my time.
It will hurt my team.
It will hurt my wagon.
The bad road is my foe.
I will get rid of the bad road.

By the time an adult made it to Stewart's *Country Life Reader, Third Book (1917)*, a more sophisticated article reprinted from *American Highways* dealt with aesthetic conditions of roads. Gray also stressed a multitude of government services such as roads, streets, education, health, and mail.

Maintaining desirable governmental services required a willingness to pay for them. Cora Wilson Stewart dealt with taxes in a straight-forward manner in the *Country Life Reader*.

I shall pay my taxes.
I pay a tax on my home.
I pay a tax on my land.
I pay a tax on my cattle.
I pay a tax on my money.
I pay tax on many other things.
Where does the money go?
It goes to keep up the schools.
It goes to keep up the roads.
It goes to keep down crime.
It goes to keep down disease.
I am glad that I have a home to pay taxes on.
(Stewart, 1915, p. 22)

Writing and recitation of such statements helped reinforce their social message. Likewise, Gray (1927) made certain that taxes and tax reform came to the attention of adults. In the chapter on state services, Gray made clear that South Carolinians should not complain about state taxation.

Most of the money for state activities comes from taxation of property. The people pay taxes and together buy common benefits and common services at the lowest prices. The number of benefits and services depends largely on the amount of taxes paid. A man cannot eat his candy and keep it too.

"No taxes, no state service, Low taxes, low state service."

Let us be honest. When we applaud the cry low taxes, it may mean:

Cheap government.
Higher sick rate.
Higher death rate.
Rougher roads.
Poorer schools.

Suppose we look at our tax system. We may find we need a new system and not lower taxes. (Gray, 1927, p. 61)

Numerous other examples dealt with county and state tax rates, the low (\$5.12 per capita) South Carolina tax rate, and the many benefits of state services. Good citizens not only were polite and clean, but voted to support the many governmental services needed to make South Carolina a progres-

sive state. Of course, both Gray and Stewart advocated voting as a way to help citizens achieve the services for a progressive state.

Other Aspects of Citizenship Education

Social studies and good citizenship found development in other ways and through other experiences. Alabama adults encountered an incidental mixture of history, government, and geography supplementing the basic instruction in reading and writing. At the 1927 Mountain Adult School in Clay County, Alabama teachers M. G. Satterfield and J. M. Teal dealt with specific Alabama historical events such as the battle of Horseshoe Bend where "Andrew Jackson whupped the Indians" (G. Alford & J. Alford, personal communication, March 18, 1984). Social studies for black teacher Marie Coles of Chambers County, Alabama included geography material such as the shape of the earth, water comprising three-fourths of the earth's surface, the discovery of America, and map work dealing with Alabama, Mississippi, and Georgia. She also used history to teach about the United States flag, George Washington Carver, and Booker T. Washington (M. Coles, personal communication, March 17, 1984). Grover Hill, not yet out of high school, taught black Chambers County, Alabama illiterates about the United States and foreign countries such as Holland and England. Hill's adult students read assignments which stressed the crops of varied regions and countries as well as planting dates, cultivation, and the harvesting process (G. Hill, personal communication, March 17, 1984).

More ambitious social studies experiences took place under Wil Lou Gray's leadership in South Carolina. Trips to Columbia and Charleston, SC as well as to Washington, DC taught adults a variety of important lessons. In 1928 Gray orchestrated a special trip to Charleston, with the following objectives:

1. To create in pupils desire to see and appreciate the beauties of Charleston and get South Carolina history first hand.
 2. To provide for pupils a motive for saving.
 3. To create in pupils an understanding of civic and social values.
- (Department of Adult Education, 1928)

The Charleston trip guidelines suggested that teachers break down the preparations into the following activities (a) getting ready for trip (budget, manners, clothes, travel), (b) the city beautiful by the sea, (pictures of Charleston and environs), (c) beauty spots (gardens, trees, iron gates, and such), (d) a study in contrasts: Charleston 1778-1928 (dress, customs, improvements brought about by taxes, transportation, schools), (e) noted seacoast people, and (f) what Charleston does for South Carolina. A project outline helped teachers deal with creation of a transportation committee, hotel committee, sightseeing committee, and history committee. Lessons VII to XIX dealt with the "Report of History Committees" whose tasks were the "assembling of a library and other materials, references, . . ."

Through the history committees, adults could learn the use of the index and the table of contents as well as learn about important South Carolinians such as John C. Calhoun, Francis Marion, and Thomas Sumter. In addition, students could make reports on outstanding sights of Charleston such as the Tea Gardens, The Battery, Fort Sumter, and the Old Powder Magazine (Department of Adult Education, 1928, pp. 1-5). Carefully organized and well publicized, the trip to Charleston provided adults with an experience far beyond their usual domains and combined the multiplicity of objectives common to the southern literacy campaign. Money management, politeness, appreciation for and understanding of South Carolina government and history all meshed conveniently in such travel experiences.

Virtually every year created a travel opportunity with objectives similar to the Charleston trip. Annual pilgrimages to Columbia, SC provided thousands of blacks and whites with intensive experiences designed to broaden their backgrounds and learn important lessons about the functioning of state government and state history. The exhaustive logistical and educational planning by Gray and her secretary resulted in exposure to a variety of places. A letter dated 6 April 1932 informed adult teachers of the itinerary:

We will spend the morning seeing the State House and grounds under expert guides. After assembling in the House of Representatives and hearing about five or six state relics, we will go to Washington Street Methodist Church where there will be a short religious service, an Opportunity School reunion, and lunch. After lunch will begin the ride over the city to the State Hospital, the Home for the Blind, the Confederate Home, the Governor's Mansion, the Penitentiary, the University, Woodrow Wilson's Boyhood Home, the new Auditorium, Ann Pamela Cunningham's grave in the Presbyterian Churchyard, the graves of Timrod, Hampton, and the late Governor Manning. After memorial exercises at the grave of Governor Manning, we will attend a short vesper service in Trinity Church. (Letter to Teachers or Opportunity School Chairman, 1932)

Likewise a 1930 trip to Washington, DC allowed adults to enjoy "two glorious days of sightseeing, fellowship, and jollity!" (All Aboard, 1930). For \$25.00 adults traveled by train to Washington, DC and learned United States history and government through a nonstop tour of Mount Vernon, the White House, the Capitol, the Tomb of the Unknown Soldier, the Library of Congress, as well as museums and residential areas. Courtesy, cleanliness, and wise money management received reinforcement throughout the trip.

Implications

Two major observations emerge from the data on the southern literacy campaign. First, the social studies content of the campaign appears consis-

tent with some social studies curriculum content in the late twentieth century. On the surface, answers in Cora Wilson Stewart's history drills sound strident and their verbatim memorization seems inappropriate. However, it is our experience that present-day classroom conduct of social studies comes closer to duplicating such procedures than current high-sounding rhetoric might wish one to believe. Contemporary sophistication aside, the authors suspect that a majority of present-day laypersons, classroom teachers, and administrators would feel comfortable with the literacy campaign's mixture of United States history and government, reinforcement of voting behavior, understanding and loyalty to existing democratic institutions, and measures designed to provide basic services such that the economic system can function effectively.

Patrons of the literacy campaign such as state departments of education, civic groups such as Rotary and the Federation of Women's Clubs, and cotton mill owners hardly represented the constituency likely to spawn revolutionary zeal. In 1918 the South Carolina Sunday School Association passed resolutions supporting the eradication of illiteracy (Illiteracy Commission of South Carolina, 1918), and in 1926 Ku Klux Klan members from Gaffney, SC made contributions (Illiteracy Commission of South Carolina, 1926). The social studies component did not aim at the development of analytical skills designed to question the emerging progressive South or other social and economic structures dominating the distribution of power, wealth, or privilege. Neither did the poor whites and poor blacks learn political and economic strategies which could be utilized to change existing institutional structures. The limited social studies component, however, is still recognizable as social studies. Field trips to the state capitol retain the same identity and purpose in the 1980s as they had in the 1920s. Despite overt dissimilarities, the contemporary mainstream perception of social studies apparently still has much in common with the perceptions of social studies which were supported by the southern literacy campaign.

A second observation relates to the continued status of social studies as the runt of the litter in public education. The role of social studies instruction within the southern literacy campaign proved secondary to primary objectives related to reading, writing, computation, and a modernized South. Good citizenship, be it cleanliness or knowledge of government, played second fiddle to the overall purpose of bringing adults into the twentieth century. Indeed, good citizenship via cleanliness and related virtues was emphasized regardless of whether history, government, or geography was actually taught to adults. There is some evidence that those who attended the adult classes failed to be motivated by opportunities to learn social studies and citizenship. Grady and Edna Alford attended the 1927 Opportunity School in Clay County, Alabama "to play games and mess around." (E. Alford & G. Alford, personal communication, December 16, 1982; J. B. Fuller attended to better estimate the board feet content of timber logs (J. Fuller, personal communication, March 18, 1984); George James, John Waldrup,

and Will Parish attended to learn to read, write their names, and sign a check (A. Kennedy, personal communication, December 17, 1982). L. J. Tanner attended Covington County (Alabama) Opportunity Schools to improve his skills for leisure time reading (L. Tanner, personal communication, March 19, 1984). A few even earned a better living from their Opportunity School efforts. Evelyn L. Berry reported how her father attended Opportunity Schools in Dadeville, Alabama in the late 1920s and 1930s.

. . . My father, Johnny Smith attended. I was about eleven years old. He worked so hard. I can remember him doing his homework at night, while we children did ours. He worked for the textile plant in Dadeville many years. At the time he was going to school he was an oil and band man in the Spinning Room. He was promoted to Fixer later and held this job until his retirement in 1965. Later years he studied and did radio repair as an extra job. Later TV. He had his own shop. Worked the textile plant, his shop morning hours.

The schooling helped him to be able to learn these jobs. (F. Berry, personal communication, March 18, 1984)

The proverbial bottom line motivated Johnny Smith, not the opportunity to learn about history, geography, or government. Social studies placed a distant, second, third, or fourth place in the motives of those attending adult schools. We expect that similar concerns continue to affect the status of social studies in the modern public schools.

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Effects of Test-like Practice and Mnemonics on Learning Geographic Facts

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Abstract

A common task in elementary geography is matching names in text to map locations for later reference. Four classes, 50% Anglo and 50% Black, were taught by one teacher in listen/discriminate baseline, adjunct test-like practice, mnemonics, and test-like practice plus mnemonics treatments. Test-like practice and mnemonics scores did not differ, but mnemonics were more effective than the baseline. The combination of mnemonics and practice improved recall by 160%. Clearly, a variation of Pressley and Levin's methods work effectively in this practical situation. Effects of mnemonics and practice seem complementary.

One of the most common tasks in school geography is learning to associate place names with locations on maps. In studies of the child's city, landmarks and pathways must be associated with locations on city maps; in studies of the child's state, physical features, cities, or vegetation zones must be located. In national and world geography, mountain ranges, valleys, river systems, bays and principal cities are often identified, and pupils are asked to memorize their locations.

Memorization of landmarks is not a very glamorous task, but it is logically and theoretically important. Place names are verbal symbols used in texts and news reporting to put events into spatial context, and comprehension depends upon recall of locations mentioned. More generally, knowing locations of key landmarks probably facilitates mediation between different schema; ability to visualize the Brooks Range on the northern side of Alaska permits one to apply other knowledge about arctic climates, animals, people, and pipelines to make a host of inferences about the region (McKenzie, 1981; Reynolds, 1968; Schallert, 1982).

Classroom methods of teaching these name-place associations are not well developed. When geography was subsumed into social studies, the

child-centered theorists believed that activity was essential to mental development, but that learning facts was not very important. Following that tradition, social studies theorists have invested little effort in developing efficient and effective ways of teaching name-place associations. Teachers do feel obliged to teach name-location pairs, but usually do so simply by having pupils read a passage of text or by reading the text to pupils and then having pupils complete an exercise in which pupils discriminate each name-location correspondence only once if at all. These lessons tend to be dull, unrewarding for the teacher and the pupils, and inadequate to insure that most pupils really can associate names with places during subsequent lessons.

Although social studies curriculum theorists may have neglected capes and bays geography, instructional psychologists have studied at least two instructional devices which seem quite relevant to the tasks of teaching geographic locations.

First, it has been well established that problems of directing and sustaining learner attention during reading, and of insuring that learning will discriminate and link pairs of terms can be ameliorated by inserting test-like questions immediately after segments of instruction (Rothkopf & Coke, 1964). As Rothkopf (1970) explains it, this use of frequently inserted test-like questions serves a motivating and directive function to focus and sustain pupil attention to task-relevant material. Also, there is considerable evidence that the processing that goes on in the course of answering an inserted test-like question increases ability to recall later the relevant answer from long term memory (Faw & Waller, 1976). Furthermore, such questions might be repeated at intervals after new pairs are presented as a form of drill to enhance attention, acquisition and recall. Gagne (1977) and Levin (1983) point out that retrieving information in answering questions increases the probability that the information will be accessible later, and they recommend a recall phase in instruction.

A practical problem has been that it is difficult to insure that each pupil in a group actually attempts to retrieve the answer to each question. The usual oral questions used in direct instruction normally elicit one answer from one pupil at a time and other pupils may only pretend to participate; use of written questions only elicits each answer from each pupil once. One classroom study has demonstrated improved recall of continent name-location pairs when all pupils were required to answer repeated cumulative test-like questions by pointing to locations on individual maps when compared to individually addressed cumulative questions more like those used in direct instruction (McKenzie & Schadler, 1980). Presumably this effect resulted from the test-like drill questions actually eliciting the rehearsals by each subject while conventional oral questions were only a nominal stimulus for many pupils.

A second device for aiding recall is to provide mnemonics that supply some artificial prompt that makes the stimulus (name) remind learners of

the correct response (locating the place on an unlabeled map). Bellezza (1981) concluded that mnemonics are very useful in aiding acquisition of paired associates and lists, but expressed reservations about the degree to which they increase long-term recall. He suggested that intrinsic mnemonics, custom-made links that use some feature of the stimulus term to prompt some feature of the correct response, should be less subject to forgetting or to retroactive inhibition than extrinsic mnemonics. Pressley, Levin, and Delaney (1982) reviewed research on keyword mnemonics, which isolate some distinctive feature imbedded in the stimulus term and then suggest mental imagery linking that feature to a distinctive feature of the correct response, and concluded that keyword mnemonics facilitate acquisition. To date, most keyword studies involve memorizing lists of paired words in laboratory settings, and do not test retention. A need has been stated for more research on other applications, such as learning materials from text, and for comparisons with alternate methods of guiding processing (Levin, Shriberg, & Berry, 1983).

There is a third possibility of considerable practical and some theoretical import. Levin (1983) theorized that recording a stimulus into a mnemonic, relating the mnemonic to the response, and retrieving the response from memory when presented with the original stimulus are critical steps in learning associations by mnemonic strategies. Providing a mnemonic or asking practice questions prompts one or the other step in the learning strategy, but neither device insures that learners perform both steps. If keyword mnemonics function through imagery and enhancing encoding, and test-like practice questions motivate attention or develop a retrieval path from memory, a combination of mnemonics and test-like practice during instruction may have complementary functions and could be combined to produce greater learning than either device alone. That is, the imagery and encoding of mnemonics may enhance acquisition and encoding and increase success of practice on test-like questions, while the test-like practice might sustain and reinforce attention to and processing of additional mnemonics as they are presented, and thus increase the odds that each pupil will engage in the necessary retrieval steps.

The practical purpose of this study is to evaluate application of repeated test-like practice, mnemonics, and a combination of mnemonics and test-like practice in the common but neglected task of teaching pupils to match proper names with landmarks on unlabeled maps. The more theoretical purpose is to compare separate and combined effects of these devices to test the possibility that mnemonics and test-like questions have complementary or additive effects.

Method

Subjects

Four intact fifth-grade classes at a single desegregated elementary school served as subjects. Treatment groups were homeroom classes to which

pupils were systematically assigned on the basis of scores on the Iowa Test of Basic Skills (ITBS) to distribute abilities evenly among classes at the beginning of the school year. Pupils were first ranked by reading achievement score and then assigned in sets of four in rotating order to each class. In the few cases where the routine was broken (e.g., to separate individuals or balance race distributions), trades were made of children with almost equivalent scores. Assignment to groups was not random, and school privacy policy prevented access to ITBS scores. The vested interests of the teachers, who made the assignments, and the matching process appear to have produced classes as equivalent in ability as would be achieved by random assignment of relatively small numbers. Each class was composed of approximately 50% Black and 50% Anglo pupils bused to the central school from opposites sides of a large southwestern city. Classes were extremely heterogeneous in ability. Policies used for protecting identity of human subjects and avoiding comparison of races precluded subdividing the sample by race in analysis.

Materials and Procedures

Materials and procedures were designed to be as practical, realistic and replicable as possible while controlling treatment variables.

Materials consisted of pages 334, 335, and 336 (Geography of the Pacific States) in the widely adopted text *The United States and the Other Americas* (King, Dennis & Potter, 1982). These Texas pupils were generally unfamiliar with this region. The text passage identified the major mountain ranges, peaks, plateaus, valleys, and bays individually in a series of very brief sentences. An appropriate, labeled, physical features map of the region was printed as an insert on a page facing the prose. A transparency was made directly from the maps in the text for use in helping the subjects locate points during instruction. Fourteen proper names and corresponding landmarks were selected from this passage to serve as experimental content.

The same instructor, introduced to pupils as a professor from the local university interested in geography and learning, taught each of the four experimental classes, using the same introduction, reading the same text to pupils and asking the same initial discriminating questions in each treatment.

In the first or *baseline* treatment, the instructor made some introductory remarks about the importance of learning place names to improve understanding of later text which mentions those names, and then proceeded to read the text to pupils. When one of the relevant place names was introduced in the text, the instructor digressed from the book, displayed the regional map transparency, pointed to the location of the feature on the map, and asked all pupils to point to the feature on the map printed in their text. As pupils pointed, the instructor walked quickly around the classroom to verify that pupils were pointing to the correct location, or to correct those who were not. This combination of reading plus one-trial discrimination of each name-place pair of each of the 14 pairs composed the entire treatment

for the baseline (control) group. The pace of this presentation was leisurely and the lesson, with the introduction, required about 22 minutes.

The second, or *test-like practice group*, received exactly the same presentation. In addition, the instructor periodically quizzed pupils by naming a previously introduced place, asking all pupils to point to it quickly on their maps, and glancing about the room to check responses. After pupils had pointed, the instructor pointed to the correct location on the transparency as feedback. Each of the 14 pairs were rehearsed four times by this method during the 25 minute treatment.

The third, or *mnemonics*, treatment included the same basic presentation and one-trial check of discrimination as the baseline and test-like practice groups. In this case, however, the instructor supplied an intrinsic keyword mnemonic by isolating a feature of the place name and demonstrating a match of that feature to the shape of the referent on the map. Two types of mnemonics were given: matching initial letter to the shape of the landmark (e.g., Sierra begins with s and the correct mountain range is s-shaped), or using links between words in the name and a related feature of place (e.g., Puget Sound—sound reminds one of ear and refers to the ear-shaped bay; Coast Range follows the coast line; Cascade Range is like a waterfall pouring down from this large river). All pupils pointed to the locations once during the initial presentation, but there were no repetitions of test-like questions in the mnemonics treatment. This treatment also lasted 25 minutes.

The fourth, or combined, treatment involved the same read, point, and check presentation as the other treatments. It included the same presentation of mnemonics as in the mnemonics-only group. It also included the same use of repeated test-like questions as in the test-like practice group, except that each item was rehearsed three rather than four times and the pace of the presentation was faster to help control treatment of time. This treatment lasted about 28 minutes.

Instruments

Immediately after each treatment, the instructor asked pupils to close their texts and distributed a recall test which required pupils to match a list of printed place names with their corresponding locations on an unlabeled map. The test consisted of the 14 place names numbered and printed in alphabetical order on the left side of a page, and a reproduction of the text map with names omitted and circles substituted at each location on the right side of the page. Pupils were to write the number of each place name in the appropriate circle.

No further mention was made of this lesson or its content during the following week. One week later, all classes were given the same test as a measure of long-term retention.

Results

Immediate and delayed posttests were scored, and group means and standard deviations are reported in Table 1.

Table 1
Immediate and Delayed Means
and Standard Deviations

Group	Immediate		Delayed	
	Mean	Deviation	Mean	Deviation
Baseline	6.89	3.12	4.06	2.68
Test-like Practice	9.0	3.93	6.73	4.30
Mnemonics	9.5	4.77	8.35	4.77
Combined	12.27	2.48	10.57	4.12

Immediate posttest scores were compared between groups by analysis of variance for unequal group sizes, and the results are reported in Table 2. A significant difference was detected at the $\alpha = .001$ level. Tukey contrasts were computed on the pairs of means. These contrasts indicated significant differences between the baseline and mnemonics groups, the baseline and combined groups, and the test-like practice and combined groups at the .05 level. No significant difference was detected between the baseline and test-like practice group, the test-like practice and mnemonics groups, or the mnemonics and combined groups. We conclude that the use of mnemonics substantially improved scores on immediate recall.

The same analyses were conducted on delayed posttest scores, with results reported in Table 3. Again the analysis of variance yielded a significant F value at the .001 level, and Tukey contrasts were calculated. Again, the mnemonics treatment had higher scores than the baseline treatment, and the combined treatment had higher scores than baseline or test-like practice groups at the $\alpha = .05$ level. Again, differences between baseline and test-like practice, test-like practice and mnemonics, and between mnemonics and combined groups were nonsignificant.

Discussion

There are, of course, some technical flaws in this small scale study. Subjects were not randomly selected from a national sample; however, the study sample was composed of children bused from very different

Table 2
Analysis of Variance For Immediate Posttest Scores

Source	SS	df	MS	F	P
Between Groups	333.51	3	111.17	7.85	.001
Error	1246.4	88	14.16		
Total	1579.91	91			

Table 3
Analysis of Variance For Delayed Posttest Scores

Source	SS	df	MS	<i>F</i>	<i>P</i>
Between Groups	449.37	3	149.79	8.58	.001
Error	1222.68	70	17.47		
Total	1672.05	73			

neighborhoods and was approximately 50% Black and 50% Anglo. With this range of subjects, we believe the findings are reasonably generalizable.

Similarly, pupils were not randomly assigned to treatments for the immediate purposes of the study, and access to aptitude or achievement scores was not granted to permit a check of equality of groups. We believe, however that groups were well matched for relevant ability levels and racial composition, possibly better matched than random assignment to small groups would have achieved because of the care taken within this team of homeroom teachers, in part out of self-interest, to insure an equal distribution of races and abilities among classes.

Treatment variables were very carefully controlled by use of the same instructor and use of the text, the mnemonics and test-like questions as a script. The three minute difference between treatment times is actually a very small difference for classroom studies. Certainly the very dramatic differences in means can not be parsimoniously explained by any apparent feature of assignment or confounding treatment variable.

The study clearly demonstrates that a form of keyword mnemonics dramatically enhances acquisition and retention of geographic facts in a realistic classroom setting and thus helps to resolve questions about use of mnemonics with classroom text materials mentioned by Levin, Schriberg, and Berry (1983), and also about the value of mnemonics in aiding long-term recall raised by Bellezza (1982). We believe, incidentally, that pupils enjoyed the mnemonics; after the first few were suggested, pupils would lean forward in anticipation, giggle, or comment on new mnemonics, and several commented after the delayed posttest that they could remember those tricks.

A second interesting aspect of the study was the comparison between test-like practice and mnemonics on acquisition and retention. The findings suggest that there is no significant difference in immediate or delayed posttest scores between the test-like practice and mnemonics groups. This is not consistent with the pattern in findings comparing keyword mnemonics with direct instruction involving repeated, rapidly paced low-level recall questions noted by Mastropieri, Scruggs and Levin (no date) which reported superior effects for mnemonics. Two differences in the studies may account for this discrepancy in findings. First, Levin maintains the mnemonics used

in their studies were better planned than the mnemonics used in this study, and so effective that there was no room for improved achievement; clearly there were errors on mnemonics group tests in this study, so this explanation is credible, although there were no patterns in item errors. Second, we note that the studies comparing mnemonics and direct instruction were done in individual tutorial settings, not with regular classroom groups. Perhaps there is some feature of social dynamics or personalized communication that increases effects of mnemonics in tutorials or increases effects of test-like questions in classroom groups.

Finally, although the effect was not statistically significant by this method of analysis, we note that when test-like practice was added to the baseline treatment or the mnemonics-only treatment the means increased about half a standard deviation on both immediate and retention tests. We think it would be wrong to conclude that test-like postquestions had no effect or function in this kind of task. It is possible, for example, that the necessity to answer frequent questions increases or sustains attention to new S-R pairs and/or to the mnemonic devices linking them, as inserted test-like questions have been shown to do in Rothkopf's (1970) study. It did seem that students stayed on task more when they realized they were individually accountable for answers to all pairs on each trial, as was objectively demonstrated in other classroom studies (McKenzie & Henry, 1979; McKenzie & Shadler, 1980). We subjectively felt that pupils in the combined treatment liked the interspersed test-like practice, if only because the very high rate of correct answers was reassuring or rewarding. More research is required to determine whether any psychological interaction exists between mnemonics and test-like practice.

The practical purpose of this study was to evaluate simple methods of dealing with a basic and common kind of classroom lesson that is important to teachers but has been neglected in prescriptive methods literature. Results clearly demonstrate that principles developed from educational theory and research do work in realistic classroom settings. In this era of criticism of educational theory, it is gratifying to show a 160% difference in pupil scores on a realistic classroom task due to application of theory.

Indeed, contrary to traditional assumptions that memorizing landmarks is unpleasant, it is our belief that occasional lessons of this sort, which use both mnemonics and frequent test-like practice, can be very positive experiences for children and teachers. Most of the elementary day is spent in slow-growing skill subjects without much clear daily progress. An occasional landmarks lesson can begin with total ignorance and a clear goal, a teacher can show off with amusing or creative mnemonic links between name-place pairs, and pupils can be highly engaged in a fast paced series of "Everyone point to . . ." responses with high success rates. And pupils can see concrete, objective gains in knowledge on formal tests by the end of the period. If the landmarks are important, the facts learned will be useful to students later.

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Effectiveness of Four Concept Teaching Strategies on Social Studies Concept Acquisition and Retention

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Abstract

Effects of four concept teaching strategies, designed to facilitate concept formation, were compared. Students (147) were randomly assigned to a two-day treatment condition within six ninth-grade world history classes. Posttest and retention test scores were obtained. Two $5 \times 2 \times 2$ ANOVAs (five treatment conditions including a control group, two reading ability groups, and two sexes) resulted in significant main and interaction effects. Results showed the following: (a) the strategy that emphasized prototype formation by focusing on a clear case and elaborating upon that clear case by contrasting it with newly encountered examples was the most effective strategy for both acquisition and retention; (b) more capable readers scored higher than less capable readers on each test; and (c) males scored higher than females on each test.

Concept acquisition and retention continue to be important in social studies instruction (History-Social Science Framework Committee, 1981) as educators frequently advocate the teaching of structures, inquiry, and concepts (Hertzberg, 1981). Although social studies educators often disagree as to what constitutes a concept (Bonstingl, 1980; Martorella, 1972; McKinney, Larkins, Ford, & Davis, 1983; Senesh, 1966), there seems to be little disagreement that there is a plentiful supply of concepts in the field. Educators are challenged not only with defining social studies concepts but with developing effective instructional means of conveying these concepts to students.

Merrill and Tennyson (1977) have presented a useful definition of the term concept that can be used in instruction. They define it as a set of specific objects, symbols, or events that share the same essential *critical attributes*. Such a set can be referred to by a particular name or symbol. Accepting this definition, concept learning is defined as the correct classification of an instance (a general term that refers to both members and nonmembers of a concept set) as either an example (an instance that is a member of a concept set) or as a nonexample (an instance that is not a

member of a concept set). In other words, students are taught a concept, and how to determine whether newly encountered objects, symbols, or events are or are not examples of that concept.

While several concept teaching strategies have been developed for use in the classroom (Bruner, Goodnow, & Austin, 1956; Gagne, 1965; Joyce & Weil, 1980; Klausmeier, Ghatala, & Frayer, 1974; Martorella, Jensen, Kean, & Voelker, 1972; Merrill & Tennyson, 1977; Tennyson & Park, 1980; Weil & Murphy, 1982), it is unclear which teaching strategy is most effective for conveying social studies concepts. Based upon the most recent empirical studies of concept teaching strategies (Tennyson & Park, 1980; Park, 1984), two theoretical positions have been developed that attempt to explain what a student must do to learn a concept effectively. From these two positions, teaching strategies have been developed to teach concepts to students.

The first theoretical position (Tennyson & Park, 1980) contends that students learn a concept by memorizing a list of critical attributes that are provided by a source (e.g., teacher or textbook) rather than by students themselves, by inferring a set of rules that explain the various relationships among critical attributes, and by practicing the classification of instances as either examples or nonexamples (see also McKinney et al., 1983; Tennyson, Steve, & Boutwell, 1975).

The second theoretical position (Millward, 1980) contends that students learn a concept by forming a prototype in their memory through focusing on a *best example* that is provided by both external sources (e.g., teacher and textbook) and internal sources (i.e., idiosyncratically organized information that is associated with a learner's cognitive structure), and by practicing the classification of instances as either examples or nonexamples (Millward, 1980; Park, 1984; Tennyson, Chao, & Youngers, 1981; Tennyson, Youngers, & Suebsonthi, 1983).

The purpose of this study was to compare the effectiveness of concept teaching strategies that focus on an organized list of critical attributes with concept teaching strategies that stress best examples. This study was designed to compare both the presentation of critical attributes or best examples and the means by which the critical attributes or best examples are stressed. That is, this study compared the effectiveness of different types of instances (examples and/or nonexamples) that stress a concept's critical attributes with best examples in concept lessons.

Based upon previous research findings (Dunn, 1983; Park, 1984; Tennyson et al., 1981; Tennyson et al., 1983), it was hypothesized that concept teaching strategies that stress an organized list of critical attributes would be more effective than concept teaching strategies that stress best examples for concept acquisition. The hypothesis that best example teaching would be more effective than critical attribute teaching also was tested.

Previous research findings (Klausmeier et al., 1974; Merrill & Tennyson, 1977; Tennyson & Park, 1980) also led to the hypothesis that strategies presenting examples only (stressing either a concept's critical attributes or a

concept's best examples) would be more effective than concept teaching strategies presenting both examples and nonexamples (stressing either a concept's critical attributes or a concept's best example).

Last, based upon the well-documented relationship between reading ability and academic achievement (Dallmann, Rouch, Char, & DeBoer, 1978; Singer & Donlan, 1980), and based upon previous concept learning and the possible effect of sex on concept acquisition (McKinney et al., 1983), it was hypothesized that reading ability, and perhaps sex, would influence the effectiveness of the concept teaching strategies.

Method

Subjects

There were 190 ninth-grade students (93 females and 97 males), approximately 14.5 years of age, who participated in this experimental study. Of the 190 students, data for only 147 (74 females and 73 males) were used for the analyses because 43 students (22.6%) did not attend school each day of this experimental study. Students were enrolled in one of six ninth-grade world history classes at an urban-sprawl, lower-middle class California junior high school (grades seven through nine). Two of these classes were classified as *honors* (gifted and talented) and four were classified as *normal* (heterogeneous). Within each of the six classes, students were randomly assigned to treatment groups. Data from the reading test of Comprehensive Tests of Basic Skills (Level H, Form U, 1981) were used for a standardized measurement of reading ability. Students (72) who had a national percentile score below 60 were, for the purpose of this study, classified as low reading ability students, while students (75) who had a national percentile score at or above 60 were classified as high reading ability students. The 60th percentile was used as the separation score between the two reading groups because that was the midpoint for the students in this study.

Treatment

Treatments consisted of four concept teaching strategies and a control group. The four concept teaching strategies presented four social studies concepts through self-instructional booklets written by the author. The treatment occurred for two consecutive days for 20 minutes per day. The four concepts were (1) direct democracy, (2) indirect democracy, (3) oligarchy, and (4) dictatorship. They were selected from a social studies textbook (Bonstingl, 1980) which is often used in tenth-grade social studies classes in the area where this study was conducted. The concepts of direct democracy and indirect democracy were presented on the first day of the treatment period, and the concepts of oligarchy and dictatorship were presented on the second day.

Each of the four concept teaching strategies presented lessons in five steps. Table 1 summarizes these five steps for each strategy. Step one and

Table 1
Summary of the Four Concept Teaching Strategies

Step	Strategy			
	Strategy 1	Strategy 2	Strategy 3	Strategy 4
1	Introduction	Introduction	Introduction	Introduction
2	Definitions	Definitions	Definitions	Definitions
3	Critical Attributes Stressed	Best Example Stressed	Critical Attributes Stressed	Best Example Stressed
4	Examples Only	Examples Only	Examples and Nonexamples	Examples and Nonexamples
5	Practice Presentation that stressed Critical Attributes	Practice Presentation that stressed Best Example	Practice Presentation that stressed Critical Attributes	Practice Presentation that stressed Best Example

step two were identical for each strategy. Step 1 was a brief introduction to that day's lesson and included a general explanation of how the self-instructional booklets were to be used. Step 2 was the presentation of two concept definitions, direct democracy and indirect democracy the first day and oligarchy and dictatorship were the second day.

The last three steps for each strategy differed. Step 3 was the presentation of either an explanation of each concept's critical attributes or the presentation of a best example of each concept. Strategy 1 and Strategy 3 groups received explanation sheets that stressed the critical attributes of direct democracy and indirect democracy on the first day and that stressed the critical attributes of oligarchy and dictatorship on the second day. Strategy 2 and Strategy 4 groups received best examples sheets that stressed the best examples of direct democracy and indirect democracy on the first day and oligarchy and dictatorship on the second day.

Step 4 was the presentation of either examples only or examples and nonexamples of each concept. Strategy 1 and Strategy 2 provided only examples of each concept stressing either the critical attributes of each concept (Strategy 1) or best examples of each concept (Strategy 2). Examples (16 examples of each of the 4 concepts) were grouped into 8 rational sets (4 rational sets per day for two days). Each rational set presented two concepts. Examples within a rational set were matched according to similar variable

attributes (characteristics shared by some, but not all, members of a concept set). Rational sets that contained examples only presented eight examples each of two concepts. Strategy 1 and Strategy 2 students read eight examples each of direct and indirect democracy on the first day, then they read eight examples each of oligarchy and dictatorship on the second day.

Strategy 3 and Strategy 4 provided both examples and nonexamples of each concept as a means of either stressing the critical attributes of each concept (Strategy 3) or the best example of each concept (Strategy 4). In this study the examples of one concept were used as nonexamples of a second concept. Consequently, rational sets that contained examples and nonexamples used the same 64 instances as the rational sets that contained examples only, except that the 64 examples were identified as either examples or nonexamples, and they were sequenced differently. Within each rational set, four examples of each concept were identified as examples, while four examples of each concept were identified as nonexamples. That is, by alternating examples and nonexamples, one concept had four of its examples identified as examples and four of its examples identified as nonexamples. Strategy 3 and Strategy 4 students read four examples of direct democracy alternating with four examples of indirect democracy that were identified as nonexamples of direct democracy. This presentation was immediately followed by four examples of indirect democracy alternating with four examples of direct democracy that were identified as nonexamples of indirect democracy.

All 64 examples were presented in short paragraph form. They were selected from social studies textbooks (Bonstingl, 1980; Paxton, 1984; Wallbank, Schrier, Maier-Weaver, & Gutierrez, 1977), and referred to existing or previously existing governments. At the end of each example there were instructions to compare that example with either the critical attributes on the explanation sheet (Strategy 1 and Strategy 3) or with the best example on their best examples sheet (Strategy 2 and Strategy 4).

Step five was the presentation of a practice test. The practice section required students to classify eight newly encountered instances. Students classified each instance as either as an example of one concept (e.g., direct democracy) or another (e.g., indirect democracy). Upon completion of the practice test, students were provided with the correct answers. They were instructed to correct their practice tests and to consider why each answer they gave was correct or incorrect based upon their explanation sheet (Strategy 1 and Strategy 3) or their best examples sheet (Strategy 2 and Strategy 4).

Instrument

The instrument used in this study contained 54 items. It was administered three times: as a pretest, as a posttest, and as a retention test. Test format was multiple choice with five options for each question. These items contained 54 examples of governments (10 direct democracy, 14 indirect democracy, 12 oligarchy, 13 dictatorship, and 5 none of the above). Test items were not included in the instructional booklets.

Even though the students were randomly assigned to treatments, the pretest was used to verify the equality of group means. The posttest and the retention test were used to assess learning achievement. Students responded to all 54 pretest items on one day during their regularly scheduled class. Students responded to approximately half of the 54 posttest items on each of two consecutive days (26 items on the first day and 28 items on the second day) because each treatment group received only two of the four concepts per day. Students responded to all 54 delayed posttest items on the same day.

The reliability of the test was determined in two ways. A test-retest coefficient of .85 was obtained between posttest scores and retention test scores. Reliability was also estimated by using Cronbach's alpha which produced a coefficient of .81.

The validity of the test was determined in two ways. One way was to have three independent college graduates (one majored in biology, one majored in social science, and one majored in history) classify the examples in the lessons and in the tests independently. Interrater agreement was 93%. Based upon the 7% disagreement, eight items were eliminated from the study prior to implementation. The second way was to examine construct validity through principal-components analysis. It was assumed that the analysis would result in five factors explaining most of the variance; however, analyses were conducted with three, four, five and six-factor loadings. The promax method of oblique rotation was used. The resulting scree plots of eigen values revealed that the majority of the 54 questions were loaded on five factors. The five loadings accounted for 95% of the cumulative variance. Analyses of the factor patterns revealed a consistent factor loading on each of the four concepts and on the none of the above alternatives of the test.

Procedure

This study took four school days (six 45 minute blocks of time per day) over a three-week period. The first day (week one) was used to administer the pretest. Students who took the pretest were then randomized into either one of the treatment groups or the control group. The four teaching strategies were then randomly assigned to the four treatment groups. One week after the pretest, days two and three (consecutive days of the second week) were used to have students read their lessons and to have students respond to the posttest. Students in each of the four treatment groups were asked to write down the exact time that they started and completed their lesson for each of the two days. This measurement included only the time it took each student to read and study the five steps of each lesson, and did not measure the time it took students to take the posttest.

Students in the control group were instructed to read portions of their world history textbook (Wallbank et al., 1977) that considered the four concepts in this study. Of the 42 pages read by students in the control group for

the two days, the four concepts of this study were specifically mentioned in only five paragraphs. Precisely one week after the first lesson (week three), the retention test was administered. At no time were students given information on the correctness of their responses of any of these tests.

Results

An univariate test (ANOVA) was performed on the time students used in each treatment group and in the control group to read and study their lessons to verify that time had been controlled among groups. No significant differences among the treatment time means were found. The resulting $F(4,143) = 0.27$ was nonsignificant at the .05 level. Means ranged from 19 to 20.5 minutes.

Another ANOVA was performed on the pretest scores to verify that there were no significant differences among the groups prior to students reading and studying their concept lessons. No significant differences in group means were found. The resulting $F(4,143) = 0.71$ was nonsignificant at the .05 level.

Table 2 contains means and standard deviations for the posttest and retention test. All four treatment groups scored substantially higher on the posttest than the control group. Posttest means ranged from 35.33 (Strategy 2) to 28.96 (Strategy 3) for the four treatment groups, while the control group mean was 20.27. Although the four treatment groups scored lower on the retention test than on the posttest, all four treatment groups scored substantially higher on the retention test than the control group. Retention

Table 2
Means and Standard Deviations for Treatment, Sex, and Reading Ability
from the Posttest and the Retention Test

Treatment	N	Posttest		Retention Test	
		Means	SD	Means	SD
Strategy 1	29	32.03	9.72	26.14	10.75
Strategy 2	30	35.33	10.49	30.23	11.55
Strategy 3	28	28.96	11.73	24.11	11.65
Strategy 4	31	31.10	10.18	25.32	11.28
Control	29	20.27	10.45	20.03	10.08
Reading					
Low Ability	72	22.51	9.36	17.80	7.26
High Ability	75	36.41	8.10	32.33	9.28
Sex					
Males	73	32.48	11.55	28.01	10.94
Females	74	26.77	10.61	22.45	10.99

test score means ranged from 30.23 (Strategy 2) to 25.32 (Strategy 3) for the four treatment groups; the control group held constant at 20.03.

A $5 \times 2 \times 2$ (five groups, two reading levels, and two sexes) ANOVA was performed on the posttest data. As Table 3 illustrates, three significant main effects and one interaction effect were found. The main effect for differences among treatment means was significant: $F(4,127) = 13.17$, $p < .0001$. The main effect for the difference between the two reading abilities was significant $F(1,127) = 115.83$, $p < .00001$. The high reading ability group ($M = 36.41$) scored higher on the posttest than the low reading ability group ($M = 22.51$). The main effect for the difference between females and males was also significant: $F(1,127) = 11.38$, $p < .001$. Males ($M = 32.48$) scored higher on the posttest than did females ($M = 26.77$). The interaction effect between treatment and sex was also significant: $F(4,127) = 2.71$, $p < .033$. Figure 1 illustrates this interaction effect.

Dunn's multiple comparison procedure for apriori nonorthogonal contrasts resulted in three significant t values on the posttest: (1) $t(127) = 7.81$, $p < .01$ for all teaching strategies compared with the control group; (2) $t(127) = 3.14$, $p < .05$ for teaching Strategy 2 (best examples and examples only) when compared to teaching Strategies 1, 3, and 4; and (3) $t(127) = 2.83$, $p < .05$ for teaching Strategies 1 and 2 (examples only) when compared to teaching Strategies 3 and 4 (both examples and nonexamples). No other comparison differences between teaching strategies proved to be significant on the posttest.

A second $5 \times 2 \times 2$ ANOVA was performed on the retention test data. As Table 4 illustrates, all three main effects were still found significant and a different interaction effect was found significant. The main effect for the differences among treatment means was significant: $F(4,127) = 3.99$, $p < .005$. Treatment means on all the retention test scores were: (a) Strategy 2, $M = 30.23$; (b) Strategy 1, $M = 26.14$; (c) Strategy 4, $M = 25.32$; (d) Strategy 3, $M = 24.11$; and (e) the control group,

Table 3
Summary of the Posttest $5 \times 2 \times 2$ Factorial ANOVA

Source	DF	SS	MS	<i>F</i>	<i>P</i>
Treatment	4	2916.57	729.14	13.17	.0001
Read	1	6412.74	6412.74	115.83	.0001
Sex	1	629.95	629.95	11.38	.001
Treatment \times Read	4	99.91	24.98	.45	—
Treatment \times Sex	4	599.82	149.96	2.71	.033
Read \times Sex	1	21.05	21.05	.38	—
Treatment \times Read \times Sex	4	420.72	105.18	1.90	—
Error	127	7031.15	55.36		

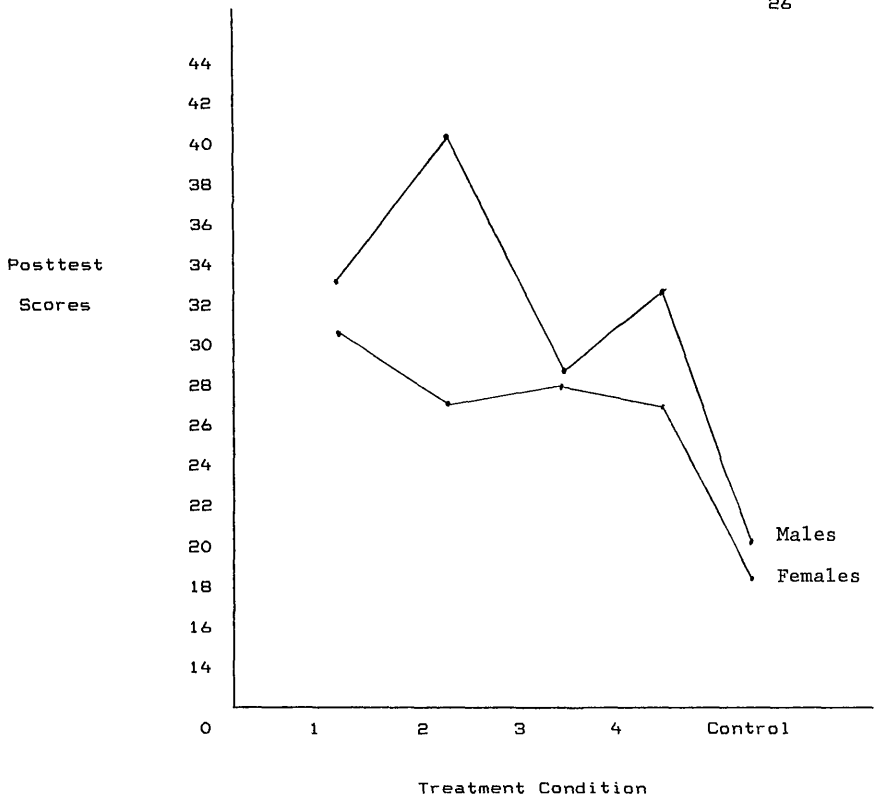


Figure 1. Treatment \times Sex Interaction on the Posttest Scores by Treatment Condition.

Table 4
Summary of the Retention Test $5 \times 2 \times 2$ Factorial ANOVA

Source	DF	SS	MS	F	P
Treatment	4	1058.35	264.59	3.99	.0044
Read	1	7312.74	7312.74	110.39	.0001
Sex	1	663.92	663.92	10.02	.0019
Treatment \times Read	4	208.11	52.03	.79	—
Treatment \times Sex	4	123.19	30.80	.46	—
Read \times Sex	1	15.07	15.07	.23	—
Treatment \times Read \times Sex	4	664.96	166.24	2.51	.0451
Error	127	8412.83	66.24		

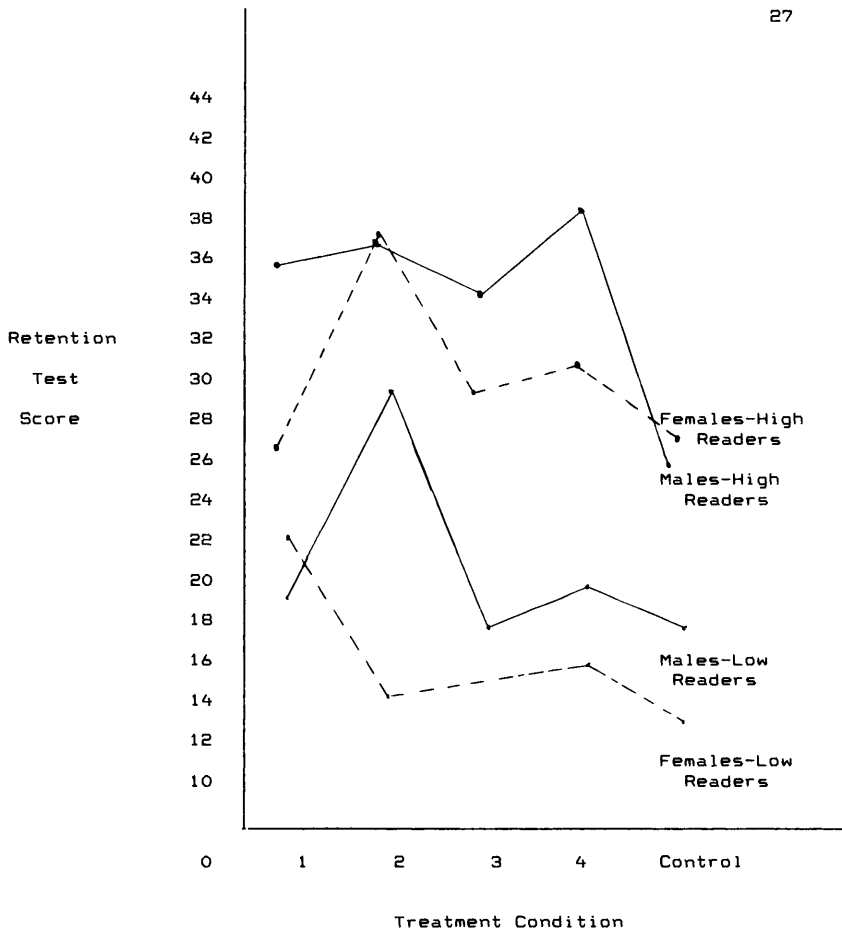


Figure 2. Treatment \times Reading \times Sex Interaction on the Retention Test by Treatment Condition.

$M = 20.03$. Treatment groups and control group means remained in the same order for posttests and delayed posttests. The main effect for the difference between the two reading ability groups remained significant: $F(1,127) = 110.39, p < .0001$. The high reading group ($M = 32.33$) still scored higher on the retention test than the low reading ability group ($M = 17.80$). The main effect for the difference between females and males also remained significant: $F(1,127) = 10.02, p < .002$. Males scored higher on the retention test ($M = 28.01$) than females ($M = 22.45$). The interaction effect among treatment, reading, and sex was significant also: $F(4,127) = 2.51, p < .05$. Figure 2 illustrates this interaction effect.

Use of Dunn's multiple comparison procedure for apriori nonorthogonal contrast resulted in two significant t values. The t values that were significant were: (a) $t(127) = 3.95, p < .01$ for all treatments when compared to the control group; and (b) $t(127) = 3.12, p < .05$ for teaching Strategy 2 (best examples and examples only) when compared to teaching Strategies 1, 3, and 4. For both acquisition and retention, Strategy 2 was the most effective used in this study. No other comparison differences were significant on the retention test.

Discussion

The findings of this study support the position that well designed and implemented concept lessons, at least in ninth-grade social studies classes, are more effective in facilitating concept acquisition and retention than the conventional means of concepts characteristically presented in social studies textbooks. All four concept teaching strategies were more effective in presenting concepts to students than the exposure to concepts that students received by only reading their textbook. It is recommended that social studies instructors identify concepts to be taught, then design and implement concept lessons that employ the strategies used in this study. It would seem, however, most useful to use Strategy 2.

In accord with previous findings (Millward, 1980; Park, 1984; Tennyson et al., 1981; Tennyson et al., 1983), the results of this study support the theoretical position that concept learning is not just memorizing a concept's critical attributes, but rather involves the formation of a prototype of a concept in a student's memory. The findings of this study also support the position that most effective instructional means in concept acquisition and retention is the strategy (Strategy 2) that emphasizes prototype formation in a student's memory by focusing on a clear case of concept (best example) and elaborating upon that clear case by contrasting it with newly encountered examples.

Why might this strategy be the most effective? It may be that students usually do not have enough time to accommodate a concept's list of critical attributes into their existing schema; whereas, they do have enough time to assimilate a clear case of a concept into their existing schema when that clear case is contrasted with newly encountered examples. Since social studies educators often have numerous concepts to teach in a short time interval, it would seem productive to measure the effect of a concept teaching strategy that employed both a list of critical attributes in conjunction with a clear case of a concept by contrasting the critical attributes and the clear case with newly encountered examples.

Although the primary focus of this study was on the effectiveness of four concept teaching strategies, student reading ability and student sex were found to be influential. Differing from the results of a previous study (McKinney et al., 1983), the findings here revealed that students who are

capable readers score higher than less capable readers. This result was expected since the strategies in this study involved extensive reading. The discrepancy between the McKinney et al., (1983) study and this one is possibly related to the greater amount of reading required by the design of the study.

What was unexpected were the effects of sex. Why did males score higher than females on both the posttest and the retention test? These findings may be related to the examples used to emphasize the four concepts, rather than to concept learning in general. Many of the examples in the instructional booklets presented governmental forms that featured military officials. It may be possible that the ninth-grade males in this study were more interested than females in governmental forms featuring military officials. Second, it may be that males react to highly structured lessons differently than females. Whether the higher scores by males are due to the examples used in the lessons of this study or due to the amount of structure involved within these lessons remains to be determined by further investigations.

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The Effects of Student Questions and Teacher Questions on Concept Acquisition

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Abstract

Previous research has failed to define clearly the effects of teacher questions on classroom achievement. Research on student questions has shown that students can be taught to ask questions, but the effects of those questions on achievement have not been determined. The purposes of the present study were to: (a) determine if students could be trained to ask questions which would increase their understanding of a social studies concept lesson; and (b) compare effects of student questions, teacher questions, and no questions. Subjects were 125 fifth- and sixth-grade students randomly assigned to one of four groups. Students in two of the groups participated in a series of small-group lessons on the development of questioning skills. Students in all four groups were taught a social studies concept by either an expository lesson or a lesson which included a series of teacher questions. Students who participated in the training sessions and who were also exposed to teacher questions during the lessons asked more questions during instruction. A two-way ANOVA on the scores on a concept test indicated no significant differences in achievement. Effect sizes indicated small to moderate negative effects (nonsignificant) of questioning on achievement. In addition to having no positive effect on achievement, teacher questions substantially increased the length of lessons.

The purpose of this study was to determine if students could be trained to ask questions which would increase their understanding of a social studies concept, and to compare the effects of those student questions with teacher questions.

Research concerning classroom questions has traditionally followed several lines: (1) observation of the number and kinds of questions asked by teachers and students; (2) the effects of higher level versus lower level questions; (3) the effects of pacing and sequencing strategies in teacher questioning; (4) investigations of a number of variables associated with text-inserted

questions; and (5) the effects of training students to apply particular questioning strategies.

Review

Observational Studies

Several systems have been developed to objectively describe classroom verbal behavior such as questions (Amidon & Flanders, 1967; Amidon & Hough, 1967; Brophy & Evertson, 1974). Researchers have found that a large number of questions are asked in classrooms and that most of those questions are asked by teachers rather than by students (Bellack, Kliebard, Hyman, & Smith, 1966; Corey, 1940; Davis, 1970; Dillon, 1982; Dodl, 1966; Floyd, 1960; Houston, 1938; Stevens, 1912). Other researchers have reported that most of these teacher questions are at lower cognitive levels (Bartholome, 1969; David & Tinsley, 1967; Gall, 1970; Gallagher, 1965; Hargie, 1978; Smith, 1976).

Higher Level Versus Lower Level Questions

Many researchers have tested the hypothesis that higher level questions lead to higher achievement. Dunkin and Biddle (1974) and Rosenshine (1971, cited in Gall, 1984) reviewed studies from the 1960s and reported that there were no clear trends in the data to indicate that the level of teacher questions has a significant effect on student learning. Similarly, Winne (1979) critically reviewed 18 studies on the effects of higher level versus lower level questions and concluded that the level of questioning makes little or no difference in student achievement. He noted that his review included several studies which had serious methodological flaws. However, he reached the same conclusion after repeating the analysis with only the studies which he judged to be methodologically sound.

Redfield and Rousseau (1981) arrived at a different conclusion after applying a meta-analysis technique to the results of 14 experimental and quasi-experimental studies on the effects of higher level questions. Their results indicated definite gains in achievement for students who were taught with higher level questions.

A review by Rosenshine (1976) seemed to contradict the conclusion of Redfield and Rousseau (1981). Rosenshine reported that students learned best when teacher questions were factual, when students were expected to know an answer rather than guess or offer an opinion, and when the teacher immediately reinforced a response as right or wrong. Gall (1984) offered an explanation for the contradictory findings based on an analysis of the student populations of the two reviews. The studies reviewed by Rosenshine involved disadvantaged primary grade students, while the studies reviewed by Redfield and Rousseau represented a much wider range of ability levels and ages. Gall argued that achievement for young disadvantaged students primarily involves mastery of basic skills and knowledge and that factual questions are on this basic level. Thus, he concluded that factual questions

seem to facilitate achievement for these students. He also concluded that higher level questions seem to be more effective with average to high ability students who have the necessary prerequisite background knowledge.

Rosenshine (1979) pointed out that research results in this area may be misleading because of the nature of higher cognitive level questions. He stated that since these questions were often opinion questions rather than questions directly related to specific content, responses to these questions may not always be academically engaged time and thus may have little or no impact on measures of content learning.

Student Questions

A century ago, Fitch (1880) wrote that good teachers always encourage their students to ask questions. He said, "You are half-way to the knowledge of a thing, when you can put a sensible question upon it" (Fitch, 1880, p. 190).

Many other educators also have recommended that research should focus on student questions rather than on teacher questions (e.g., Barker, 1974; Carner, 1963; Costa, 1984; Gall, 1970; Houston, 1938; Hunkins, 1966; Sadker & Cooper, 1974b). Chaudhari (1975) and Postman and Weingartner (1969) suggested that good students have the ability to ask questions to satisfy their hunger for learning. Stirling (1937, cited in Zimmerman & Pike, 1972) found that question production correlated positively with IQ and socioeconomic status. Empirical studies by Pritchard (1969) and Darwezah (1982), however, reported no significant relationship between student questions and student achievement. Darwezah pointed out that student questions might have an effect on achievement if students were first trained in questioning skills.

Training Students to Ask Questions

Dillon (1981) reported that 95% of the preservice teachers polled said that students often have questions in class but that they fail to ask those questions. Carner (1963), Gagne (1969), Marksberry (1979), Suchman (1962), Torrance (1971), and Winston and Anderson (1977) stated that questioning skills should be taught to students through well-planned, systematic instruction. Researchers have investigated the effectiveness of a variety of techniques for training students to ask questions.

Several researchers have focused on question production in young children. Torrance (1972) reported that a creative-aesthetic kindergarten environment facilitated the development of questioning skills more than a traditional kindergarten program. Nelson and Earl (1973) were successful in changing the questioning behavior of nursery school students by implementing instructional strategies which helped the students focus attention on the categories and spatial arrangements of stimuli. Nash and Torrance (1974) developed a creative first grade reading program which helped students improve the quality of their questions. Denney, Jones, and Krigel (1979)

found that providing examples of constraint-seeking questions while also providing a rule for generating questions effectively enhanced questioning performance in young children.

Several researchers have found that a direct instruction presentation of a cognitive strategy for questioning was most effective in facilitating the growth of questioning skills in elementary students (Denney, 1974; Denney, Denney, & Zibrowsky, 1973; Rosenthal & Zimmerman, 1972). Miner (1978) reported that training upper elementary students to recognize high level questions facilitated their ability to generate high level questions. The effects were increased when the students were also given opportunities to practice writing questions with feedback and reinforcement. Sadker and Cooper (1974a) found that microteaching sessions on questioning strategies were successful in increasing the number of higher level questions asked by fifth-grade students. Hubbard (1970) developed an instructional sequence of activities to involve fifth-grade students in discussions of social problems. She reported no gains in the ability to ask higher level questions, but did note significant gains in the numbers of questions asked.

A number of other studies have reported success when students were exposed to teacher questions as a model for effective questioning strategies (Corinder, 1982; Denney, 1972; Fifer & Beach, 1980; Henderson & Garcia, 1973; Laughlin, Moss, & Miller, 1969; Rosenthal, Zimmerman, & Durning, 1970; Zimmerman & Pike, 1972). The effects of teacher modeling were enhanced when used in conjunction with parental training and reinforcement (Garcia, 1972; Henderson & Garcia, 1973; Henderson & Swanson, 1974). Allison (1982) and Denney and Connors (1974) found that the most effective treatment for improving students' questioning skills was a combination of teacher modeling and direct instruction in a cognitive strategy for questioning. Studies by Barker (1974) and Hoskin (1972), however, reported that the cognitive level of a teacher's questions is not a successful predictor of the level of student questions.

Mosher and Hornsby (1966) successfully taught elementary students to ask constraint-seeking questions to discover information about objects or people in pictures that were shown to them by the teacher. Cohen (1973) was successful in using programmed instruction materials to improve the question generating behavior of fourth-grade students.

Participation in a series of inquiry activities successfully enhanced the questioning strategies of third- and fifth-grade students (Boller, 1973). The dependent variable for Boller's study was the score on a question-asking game which had also been a part of the training sessions. Thus, it is possible that the higher scores for the trained students were due at least in part to practice with the game rather than to a generalizable change in questioning strategies. The results of other studies may also be questionable because of similarities between factors in the training session and the dependent variable measure (Cohen, 1973; Rosenthal, Zimmerman, & Durning, 1970; Zimmerman & Pike, 1972).

Pfeifer (1979) was successful in improving the questioning behavior of sixth-grade students, but reported no significant differences on an achievement test for students in the treatment or control groups. Zimmerman and Pike (1972) were also successful in increasing the number of questions asked by second-grade students, but made no attempt to examine the relationship of student questions to achievement. The effectiveness of the training in these and other studies is encouraging, but the results would have been more meaningful if changes in questioning behavior had been positively related to improved performance on an achievement measure.

Blank and Covington (1965) included a measure of achievement. They developed an autoinstructional program in problem solving to help sixth-grade science students develop questioning skills. Two of their dependent variables were designed to measure only the question-asking performance of the students. A third dependent variable was the score on a science test which required problem solving. The researchers reported significant differences favoring the trained students on all of the dependent variables. They claimed that superior performance on the science test demonstrated a relationship between the improved questioning skills and achievement. However, they also pointed out that the items on the science test did not deal directly with any of the content that had been taught in the class. Thus, it is impossible to determine if superior performance on the test was indicative of effective questioning strategies or of practice in solving problems.

Summary of Previous Research

In spite of the large numbers of studies in this area, there are relatively few definitive conclusions which can be drawn. We do know that teachers typically ask many questions and that most of those questions are at lower cognitive levels. There is also some evidence that, in certain instructional settings, higher level questions seem to enhance student achievement. We cannot, however, clearly identify learning tasks for which higher level questions are superior to lower level. Neither can we state definitively that questions at certain levels will elicit responses at those levels.

Since many teachers realize that student questions can identify points needing clarification, they repeatedly ask if there are any questions during a lesson. However, many elementary students may not know when to ask a question. If this is the case, then it is possible that training students to identify those points which are unclear would help prepare them to ask questions effectively. It is also likely that many elementary students cannot communicate their questions clearly. Since elementary students receive extensive training in the use of other communication skills, some researchers have attempted to determine the effectiveness of training students to frame and communicate questions clearly.

Unfortunately, there are few conclusions to be drawn from research for training students to ask questions. Some of the training studies were limited

to an investigation of the number of questions students asked after training. These studies indicate only that training can increase the number of questions asked, but provide little or no information about the effects on learning. In the few studies which have examined the effects of student questions, the dependent variables were often dissimilar to classroom learning tasks.

Purposes of the Study

This study had dual purposes. The first was to determine if students could be trained to ask questions relevant to their understanding of a social studies concept lesson. The second was to compare the achievement effects of student questions with the effects of teacher questions. This study differed from previous research in that students were trained to ask questions for the specific purpose of clarifying points which were not clear. It was expected that the highest achievement would be attained by students who had been trained to ask questions and who were also exposed to teacher questions during the lesson.

Another expectation involved stratification of ability levels which allowed a test for possible interaction of treatment by ability. Since previous research (Stirling, 1937, cited in Zimmerman & Pike, 1972) indicated a positive correlation between question production and IQ, the high ability students were expected to gain more from the training than the low ability students. It was hypothesized that the difference between scores for the high and low ability trained students would be greater than the difference between scores for the high and low ability untrained students.

Methodology

A stratified randomized posttest-only control group design (Campbell & Stanley, 1963) was used in the study. The sample consisted of 125 fifth- and sixth-grade students. Stratification was based on the Total Battery Percentile Score on the California Achievement Tests. Students were identified as low (below the 40th percentile), medium (between the 40th and 79th percentile), or high (at or above the 80th percentile) ability level and randomly assigned to three treatment groups or a control group. The treatments varied in the presence or absence of training in student questioning skills and in the presence or absence of teacher questions during a concept lesson.

Training Sessions

Students assigned to Groups 1 and 3 participated in four 50-minute sessions of small-group instruction in the development of questioning skills. The sessions included direct instruction in a cognitive strategy for recognizing the need for a question, framing and communicating the question clearly, and evaluating the response to the question. The students also participated in activities which provided frequent opportunities for student questions

and for feedback on their questioning skills. In addition to the instruction in questioning skills, the students were exposed to a wide variety of teacher questions during the sessions.

While students in Groups 1 and 3 were participating in the training sessions, students in Group 2 and the control group were taught lessons in elementary economics by another teacher. Each of the four training sessions is summarized below.

Training Session One

The teacher presented two discrepant events (a demonstration of surface tension and a demonstration of locating the center of gravity of an object). The teacher offered no explanation for the events but gave correct responses to clearly stated questions from the students. If vaguely worded or inappropriate questions were asked, the teacher guided the students to restate the questions in a clear and concise manner. If too few questions were asked, the teacher asked the students probing questions about their understanding of or explanation for the event. The questions guided the students to identify the information that was unknown and also served as a model for effective questions.

After the two events had been clearly explained, the teacher pointed out that asking questions about the event made the event more easily understood and asked for examples of other classroom situations in which students needed to ask questions in order to understand something. The students were encouraged to suggest specific instances in which their understanding of an assignment would have been enhanced by questions to provide further information or to clear up misunderstandings. For example, several students described situations in which they needed to ask questions to solve math problems. Other students stated that they had needed to ask questions about unfamiliar words they encountered in social studies and science textbooks. When sample situations were presented, the students and the teacher developed questions which might have been helpful in those situations. The teacher provided feedback on the quality of the questions suggested by the students.

The teacher reviewed the questions that had been asked about the discrepant events and asked questions about the appropriateness and effectiveness of each question. The students were then asked to suggest a list of characteristics of good questions. The teacher elicited responses that indicated that good questions are concisely stated, clearly communicated, and directed toward a specific purpose.

The teacher then led the students in a discussion of a strategy for asking questions in the classroom. The strategy include the following steps:

1. Recognize the need for a question.
2. Formulate a question that is directed toward a definite purpose.
3. Select the most appropriate source for an answer.
4. Ask the question clearly and concisely.

5. Listen carefully to the answer.
6. Decide if the answer is sufficient or if an additional clarifying question is needed.

Session Two

This session began with a review of the characteristics of good questions and of the steps in the questioning strategy. Several students in each group were able to describe the steps in the strategy and to explain the importance of each step.

The teacher then showed the students a large picture which included a number of objects and people. The students were told to use as few questions as possible to identify a particular object or person which the teacher had previously selected. After the students had asked a few questions, the teacher pointed out the difference in the reactive effectiveness of hypothesis-testing questions (such as: "Is it the lady with the basket?", "Is it the cooking pot by the fire?", etc.) and constraint-seeking questions (such as: "Is it a person?", "Is it something to cook with?", etc.). The teacher explained why constraint-seeking questions are sometimes more efficient and encouraged the students to use constraint-seeking questions with the activity. The activity was then repeated with a different picture. The teacher provided immediate feedback on the quality of the questions asked and modeled additional questions when needed. She explained the utility of constraint-seeking questions in a variety of occupational settings, such as a doctor diagnosing an illness and a mechanic attempting to discover the source of a problem with an automobile (Denney, Jones, & Krigel, 1979).

The teacher led a class discussion of the importance of deciding which type of question is most appropriate in a given situation. Situations were suggested which seemed most appropriate for hypothesis-testing questions, constraint-seeking questions, "what if . . ." questions, and "what, when, or where" questions.

Session Three

This session began with a review of the information covered in the two previous sessions. Students in each group were able to respond correctly to teacher questions about the characteristics of good questions, the steps in the questioning strategy, and the different types of questions.

The teacher then presented three problem situations for which the students were to suggest solutions. For each of the situations, there were additional facts which were needed to solve the problem. The teacher presented each problem and asked for solutions. As solutions were suggested, the teacher asked questions to guide the students to realize that they did not have enough information to decide if that solution was appropriate. The teacher guided the students to identify the needed information, to generate a question to ask for that specific information, and to effectively communicate that question. The teacher provided appropriate responses to the questions and also provided feedback concerning the suggested solutions.

After the three problems were solved, the teacher explained that students are often in situations in which they need more information to successfully solve a problem or complete an assignment. The students were encouraged to compare this task to classroom tasks for which they have needed more information.

The teacher presented a brief expository lesson explaining the principle of relativity in elementary terms and provided general examples to explain that time, motion, size, and direction are relative. The students were instructed to draw simple pictures to illustrate the principle. The teacher asked if there were any questions about the assignment (which was deliberately vague) or about the principle of relativity. The students were encouraged to apply the questioning strategy which they had learned and to generate questions about the principle and about the assignment. As questions were asked, the teacher guided the students to state the questions clearly and concisely and to follow the other guidelines established for effective questions.

Session Four

This session began with a review of the characteristics of good questions and of the steps in the questioning strategy. The students were asked to describe situations in which the strategy could be used. Student responses included a variety of situations such as a doctor seeking a cure for cancer, a scientist working on atomic energy research, and a student working on a math problem. The teacher pointed out that there are no readily available answers for some questions and that the individual must sometimes experiment to search for an answer.

The teacher then showed the students a small paper bag containing plastic chips of various colors but did not let the students examine the bag to see how many chips of each color were in the bag (Hunkins, 1972). The teacher asked, "How many chips would you have to pull out to make sure that you had one chip of each color? How many would you have to pull out to be sure you would get at least one red and one yellow?" The students were encouraged to guess the correct answer. The teacher guided the students to realize that they did not know enough about the chips to answer the questions and that they needed to ask for further information (e.g., total number of chips of each color, total number of colors, etc.). The teacher encouraged the students to ask appropriate questions, provided feedback on the questions, and modeled effective questions when necessary. She also responded appropriately to student questions about the problem. After the problem had been solved, the teacher reviewed the questions asked and pointed out which questions were most useful in reaching the solution.

Treatment Lessons

On the fifth day of the experiment, the students in each group were taught a lesson on transfer propaganda (an advertising technique in which a product is associated with an emotion producing a symbol or idea which has

no natural relationship to the product). The lessons for each of the four groups were scripted to maintain consistency in the content. The script for each group included the following, which was read to all students at the beginning of each lesson to encourage the students to ask questions:

Please stop me at any time during the lesson if you have a question. You may need to ask a question about one of the ads or about something that is said about one of the ads. You may ask questions anytime during the lesson.

Each lesson began with an oral definition of transfer propaganda followed by a series of eight slides of magazine advertisements. Four of the advertisements used transfer propaganda, while the remaining four did not. The script for each treatment included either an expository explanation of why each advertisement did or did not use transfer propaganda (Group 2 and Group 4) or a series of questions which required the students to classify the instance as an example or nonexample of transfer propaganda and to give reasons for the classification (Group 1 and Group 3). For example, the first slide, which was an example of transfer propaganda, showed an advertisement for a particular brand of cigarettes. The advertisement showed two athletic-looking men who had apparently just completed a climb to the top of a mountain. The men seemed to be relaxing after their climb by smoking cigarettes and enjoying the scenic view. The caption included the phrase “America’s Best” in bold letters. If the treatment called for an expository presentation, the script included an explanation that this advertisement used transfer propaganda because there is no natural relationship between enjoying a beautiful view from a mountain top and the quality of the cigarettes. In addition, the script pointed out that the phrase “America’s Best” was an emotion-producing idea unrelated to the product. If the treatment called for teacher questions, the script included questions such as: Is this advertisement using transfer propaganda? Why? What do the words “America’s Best” mean? What ideas or symbols in the picture might make someone want to buy the product?

Another slide, which was a nonexample of transfer propaganda, showed a spoonful of a breakfast cereal. The caption indicated that the cereal contained no added sugar and had “whole grain good taste.” The expository script explained that this advertisement did not use transfer propaganda because the ingredients in a cereal and the taste of the cereal have a natural relationship to the cereal. The script for the teacher questions treatment included questions such as: Does this advertisement use transfer propaganda? Why not? What could be added to the picture so that the advertisement would be using transfer propaganda?

The other six slides included advertisements for products such as cookware, make-up, soft drinks, and automobiles. The scripts for these advertisements were similar to the two described above.

To control for the content presented in each lesson, the scripted questions covered the same points which were covered in the expository script. Observers were present to verify treatments and to record the number of questions asked in each group.

Treatment Group 1

This group ($N = 30$) received prior training in the student questioning skills and were exposed to teacher questions during the lesson (SQ – TQ). During the treatment, the teacher presented the definition of transfer propaganda and the series of eight slides showing the magazine advertisements. As each slide was shown, the teacher asked questions about the advertisement and responded to student generated questions. The teacher asked 25 questions while the students asked 19 questions.

Treatment Group 2

Students in this group ($N = 34$) received no training in student questioning skills but were exposed to teacher questions during the lesson (TQ). After the teacher presented the definition of transfer propaganda, she showed the eight slides. As each slide was shown, the teacher asked questions about the advertisement and responded to student generated questions. The teacher asked 30 questions while the students asked 6 questions. (It should be noted that, although the questions for each lesson were scripted, additional probing questions were needed in Group 2. The teacher had been instructed to use additional scripted questions when necessary to elicit the correct student responses.) Since these students had not been trained to ask questions, the modeling effect of the teacher questions may have influenced the students' questioning behavior.

Treatment Group 3

Group 3 students ($N = 30$) received prior training in the student questioning skills but were not exposed to teacher questions during the lesson (SQ). After the teacher presented the definition of the concept, she presented the eight slides. As each slide was shown, the teacher presented information about the advertisement in an expository manner. The teacher asked no questions during the lesson, while the students asked 10 questions. The teacher responded to the student-generated questions.

Control Group

Group 4 ($N = 30$) served as the control group. This group received no prior training in the student questioning strategy and were not exposed to teacher questions during the lesson. After presenting the definition of transfer propaganda, the teacher showed the eight slides and presented information about the advertisements in an expository manner. No questions were asked by the teacher or by the students during the lesson.

Table 1 presents a summary of the four treatments.

Table 1
Description of Treatments

	<i>N</i>	Student Training	Number of Student Questions	Number of Teacher Questions	Time	Achievement Test Mean
Group 1 (SQ-TQ)	30	Yes	19	25	14 min.	12.53
Group 2 (TQ)	34	No	6	30	17 min.	11.85
Group 3 (SQ)	30	Yes	10	0	10 min.	13.67
Group 4	31	No	0	0	5 min.	13.94

Instrumentation

Immediately following each lesson, a 28-item, four foil, multiple choice test on transfer propaganda was administered. Each test item consisted of a slide showing two magazine advertisements labeled A and B. The advertisements, which had not been used previously in the lessons, were for products such as cigarettes, make-up, dog food, garden tools, soft drinks, and cameras. The students were given answer sheets which had four possible responses for each item. The students were instructed to mark BOTH if both A and B were examples of transfer propaganda, NEITHER if neither A nor B was an example, ONLY A if A was the only example shown, and ONLY B if B was the only example shown. As each slide was shown, the teacher read the accompanying script with a brief description of each advertisement. Each slide remained on the screen for 30–45 seconds unless a student indicated that additional time was needed with that item. The test contained four sets of seven items. Each set of seven corresponded with one of the four possible responses. Items were randomly distributed throughout the test. The test was scored with one point for each correct answer, with the highest possible score being 28. The reliability of the test was estimated to be .81 using the Kuder-Richardson 20 formula.

Data Analysis

The means and standard deviations for each group are presented in Table 2. The means of the four groups ($\bar{X}_1 = 12.53$; $\bar{X}_2 = 11.85$; $\bar{X}_3 = 13.67$; $\bar{X}_4 = 13.94$) were compared using two way ANOVA (ability level by treatment). Results indicated that there were no significant differences among the groups and no significant interaction of ability by treatment.

Effect sizes for each of the treatment groups were calculated to provide a

Table 2
Cell Means and Standard Deviations for Concept Acquisition Scores

	Low Ability	Medium Ability	High Ability	Total
Group 1 (SQ-TQ)	$n = 7$ $\bar{X} = 5.86$ $S = 2.61$	$n = 13$ $\bar{X} = 13.77$ $S = 5.22$	$n = 10$ $\bar{X} = 15.60$ $S = 4.25$	$n = 30$ $\bar{X} = 12.53$ $S = 5.74$
Group 2 (TQ)	$n = 6$ $\bar{X} = 9.67$ $S = 5.46$	$n = 16$ $\bar{X} = 11.62$ $S = 6.51$	$n = 12$ $\bar{X} = 13.25$ $S = 5.69$	$n = 34$ $\bar{X} = 11.85$ $S = 6.02$
Group 3 (SQ)	$n = 6$ $\bar{X} = 10.67$ $S = 2.50$	$n = 13$ $\bar{X} = 12.69$ $S = 3.64$	$n = 11$ $\bar{X} = 16.45$ $S = 4.63$	$n = 30$ $\bar{X} = 13.67$ $S = 4.38$
Group 4 (Control)	$n = 6$ $\bar{X} = 9.17$ $S = 3.49$	$n = 16$ $\bar{X} = 15.50$ $S = 5.22$	$n = 9$ $\bar{X} = 14.33$ $S = 6.14$	$n = 31$ $\bar{X} = 13.94$ $S = 5.62$
				Grand Mean = 12.94

better understanding of the findings. The effect sizes were: $ES_1 = -.25$; $ES_2 = -.37$; $ES_3 = -.05$. It should be noted that these effect sizes do not represent the effects of the instructional treatments compared with an uninstructed control group. The treatment for the control group consisted of an expository lesson with no questions. The content of the control group lesson was the same as for the other three treatment groups. The effect

Table 3
Summary of Analysis of Variance of Concept Acquisition Scores

Source of Variation	Sum of Squares	DF	Mean Square	F	Significance of F
Main Effects	695.7600	5	139.1520	5.458	.00015
Treatment	94.4532	3	31.4844	1.235	.30040
Ability	609.3411	2	304.6704	11.951	.00002
2-Way Interactions	176.9834	6	29.4972	1.157	.3344
Treatment by Ability	176.9833	6	29.4972	1.157	.3344
Explained	872.7434	11	79.3403	3.112	.00108
Residual	2880.7449	113	25.4933		
Total	3753.4883	124	30.2701		

sizes, therefore, are not to be interpreted as the effects of instruction on achievement, but as the added effects of the teacher and/or student questions when compared to an expository treatment.

Effects of Training on Student Questions

There were observable differences in the number of student questions in each group. (See Table 1.) Students who had been trained to ask questions and who were also exposed to teacher questions during the lesson (Group 1) asked the greatest number of questions (19). Students who had been trained to ask questions but who were not exposed to teacher questions (Group 3) asked the second largest number of questions (10). Students who had not been trained to ask questions but who were exposed to teacher questions asked 6 questions. Students in the control group asked no questions. These results indicate that the training sessions increased the number of questions.

The questions asked by the trained students appeared to be legitimate attempts to clarify points about an unfamiliar product or an unfamiliar symbol. For example, when shown an ad for an unfamiliar brand of laundry detergent, students in both of the trained groups (Groups 1 and 3) asked for information about this product. If students in two of the groups were confused about the unfamiliar brand, it is likely that there were students in the other two groups who were similarly confused. However, none of the students in the untrained groups asked for that information. These observations suggest that the training also had an effect on the type of questions asked.

Discussion

An examination of the means for the four groups reveals an interesting trend. The lesson for the control group lasted only five minutes, while the lessons for the other three groups were to three times as long. (See Table 1.) In spite of the differences in time, the control group mean was the highest of the four groups. (See Table 2.) Students in Group 2, who had not been trained to ask questions but who were exposed to the largest number of teacher questions during the lesson, had the lowest overall mean, about two points lower than the control group. This suggests that the expository teaching in the control group was a more efficient use of instructional time.

An examination of the means for each cell (treatment by ability) also reveals some interesting trends. Within the low ability groups, the lowest mean was in Group 1, in which both students and teacher asked questions. The means for the other three groups within this ability level are three to four points higher. This suggests that the large number of questions may have actually been confusing to the low ability students and resulted in a mean score which is lower than a chance score of 7. Within the medium ability groups, the control group scores were the highest—almost four points higher than the mean for the medium ability students in Group 2 (TQ). The mean for the high ability students in Group 3, in which only the

students asked questions, was over three points higher than the mean for Group 2. (See Table 2.) These trends suggest that, for the medium ability students, expository teaching was most effective and that, for the high ability students, the student questioning treatment was superior. In no ability level was the teacher questioning with no student training (Group 2) the most effective treatment.

It is possible that the length of the training period was inadequate to substantially alter the students' questioning skills. The fact that there was an observable trend in the number of questions asked in the different groups and in the means of the cells indicates that the different combination of training and teacher questioning may have had an effect which would be worth additional study. If the training period could be extended in future studies, the trends observed in this study might be replicated.

It is also possible that the criterial attributes of transfer propaganda were too abstract and thus too difficult for middle grades students. The relatively low mean scores for each group lend some support to this explanation. However, educators such as Durr, Windley, and Earnhardt (1976), May (1980), and Moffet (1976) have recommended teaching upper elementary students to detect propaganda techniques. In addition, 10% of the students scored 75% or higher on the test, indicating that the concept was not inappropriate. Furthermore, it should be noted that a less difficult concept would have minimized the need for student questions, the net effect of which might have been the virtual absence of variation in the student questions variable in all treatment groups.

Another possibility concerns the cognitive development of the students. Fifth- and sixth-grade students may be developmentally unprepared to monitor their own cognition when faced with an abstract learning task. In spite of the low mean scores which indicate a lack of understanding of the concept, relatively few questions were asked by the students. This suggests that even though many students did not understand the concept, they were either unaware of their lack of understanding or were unable or unwilling to formulate questions to increase their understanding. In either case, the results of the present study indicate that asking questions did not result in higher achievement.

Students in Group 1, who had been trained in the questioning skills and who were exposed to teacher questions during the lesson, asked the greatest number of questions. This suggests that an effective means of improving student's questioning skills may be a combination of direct instruction in a cognitive strategy and teacher modeling of questions. This supports previous research, but still fails to provide empirical evidence of the effects of student questions on classroom learning. Further research is needed to determine whether training and modeling influence anything other than the number of questions asked.

As in any research studies of this nature, the concept taught was one with

which the student had had little or no previous experience. In addition, the concept was not taught within the context of a subject area. If the concept had been taught in a traditional subject context, it is possible that the students would have had less difficulty recognizing points which needed clarification and would have applied the questioning skills more effectively. Future researchers should include provisions for building prerequisite knowledge while maintaining the controls needed for research within an experimental paradigm.

The folklore of education has consistently maintained that good teachers ask questions and that those questions lead to higher achievement. The non-significant findings in this study are particularly meaningful for those who give a blanket endorsement to classroom questions. Previous research has indicated that teacher questions may increase achievement in particular instructional settings. Findings from the present study, however, suggest that classroom questions may increase the time required for instruction without adding to achievement. Direct expository teaching may be a more efficient use of time for certain instructional tasks.

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A Quantitative Review of Research on Instructional Simulation Gaming: A Twenty-Year Perspective

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Abstract

Research on the instructional effects of simulation gaming compared to other instructional procedures was reviewed. Effect size estimates were computed for eight cognitive and affective dependent variables. The quantitative analysis indicated that simulation gaming produced greater cognitive learning to a small degree. Also, it was observed that simulation gaming produced an overall small positive effect for attitude toward the subject, a small negative effect for attitude toward social phenomena, and no differential effect for attitude toward self. Differences between the conclusions of the quantitative effect size analysis, prior reviews, and vote counts of statistical significance tests were discussed.

Simulation gaming appeared as a major instructional innovation in social studies education in the mid-1960s. Hundreds of professional articles since have been published about simulation gaming, including a substantial body of research. The frequency of published experimental studies comparing simulation gaming with other instructional techniques crested in 1975 and has tapered off dramatically since that time. Given that research interest in simulation gaming has waned, it is an appropriate time to examine the research literature to determine what we can conclude about the instructional effects of simulation gaming compared to other instructional procedures.

This review investigates effects on three types of attitudinal outcomes. One variable is simulation game participants' attitude toward subject matter addressed by simulation games and toward the general subject matter of courses in which simulation games are used (ATT SUBJ). Attitude toward simulation gaming as an instructional technique is not included in this variable. A second variable of interest is attitude toward social phenomena (ATT PHEN), such as attitude toward ethnic groups, legislative processes, and economic institutions. Attitude toward oneself (ATT SELF) is the third

affective variable; examples include sense of political efficacy and academic self-confidence.

Three cognitive variables are examined. Knowledge of facts, concepts, and generalizations as assessed by tests of immediate or short-term recall (IMM K) and delayed tests of retention (RET K) are two of the variables. Cognitive outcomes which involve the application of knowledge for purposes of analysis or decision making compose another category of cognitive outcomes (APP). Imprecise distinctions between the knowledge and application variable categories and the lack of distinction within the application category are due to the lack of conceptual clarity in most of the research reports.

Two variables involving interpersonal relationships also are investigated. Social interaction skill (INTR) refers to specific behavioral processes of interacting with people. Applying behavior modification techniques is an example of a social interaction skill. The other interpersonal variable is classroom climate (CLIM) which refers to the affective quality of student/student and teacher/student relationships.

I located nine research reviews which addressed the effects of simulation gaming on the previously identified dependent variables, except for attitudes toward self (ATT SELF) and social interaction skills (INTR). Eight of the nine were conventional narrative reviews of the literature in which particular studies were discussed and summary conclusions were produced. One of the reviews (Dekkers & Donatti, 1981) used quantitative techniques to summarize the results of a number of research reports. I was particularly interested to learn whether the quantitative reviewing techniques used in this review would clarify ambiguities in the other research reviews and produce conclusions different from the other reviews.

Prior research reviews were generally consistent about the comparative effects of simulation gaming on the cognitive variables. Regarding the immediate or short-term recall of knowledge (IMM K), one review reported that simulation gaming is generally superior to other instructional techniques (Bredemeier & Greenblat, 1981), one claimed that simulation gaming is inferior (Greenlaw & Wyman, 1973), and seven claimed that simulation gaming and other instructional techniques are equally effective (Cherryholmes, 1966; Dekkers & Donatti, 1981; Greenblat, 1973; Pierfy, 1977; Reiser & Gerlack, 1977; Thorpe, 1971; Wentworth & Lewis, 1973a). Regarding retention of knowledge (RET K), two reviews stated that simulation gaming is generally superior to other techniques (Bredemeier & Greenblat, 1981; Pierfy, 1977) and two claimed that simulation gaming and other instructional techniques are equally effective (Cherryholmes, 1966; Dekkers & Donatti, 1981). Only two reviews (Cherryholmes, 1966; Reiser & Gerlach, 1977) contained conclusions regarding effects on application of knowledge (APP). They both concluded that simulation gaming and other instructional techniques are equally effective. In summary, the large majority of

previous reviewers concluded that simulation gaming is as effective as other instructional techniques for teaching knowledge of facts, concepts, and generalizations and application of knowledge.

There was also considerable consistency regarding conclusions about the effects of simulation gaming on participants' attitudes. Four reviews (Cherryholmes, 1966; Pierfy, 1977; Thorpe, 1971; Wentworth & Lewis, 1973a) concluded that simulation gaming is more effective than other instructional techniques at producing positive attitudes toward learning the subject matter (ATT SUBJ). No review concluded that simulation gaming and other techniques are equally effective or that simulation gaming is less effective. Regarding attitudes toward social phenomena (ATT PHEN), five reviews claimed that simulation gaming is more effective than other instructional techniques at shaping social attitudes (Bredemeier & Greenblat, 1981; Dekkers & Donatti, 1981; Greenblat, 1973; Pierfy, 1977; Wentworth & Lewis, 1973a). Two concluded that simulation gaming and other techniques are equally effective (Cherryholmes, 1966; Reiser & Gerlach, 1977). No reviews concluded that simulation games are less effective. One review (Bredemeier & Greenblat, 1981) claimed that simulation gaming is more effective than other instructional techniques at promoting positive relationships within the classroom (CLIM). The reviews tended to support the belief that simulation gaming has greater effects than other instructional techniques on participants' attitudes.

Methodology

The bibliography of comparative experimental studies was generated by examining *Current Index to Journals in Education* from 1968 through 1984. For 1965 through 1968, the *Education Index* was examined to locate published articles which might contain data regarding the instructional effects of simulation gaming. *CIE* abstracts were used to eliminate obviously irrelevant articles. Approximately 400 articles remained; nearly all were available and examined individually. From these, 42 comparative experimental studies, 49 experimental simulation game design and utilization studies, and 9 general research reviews were identified. The design and utilization experimental studies were located for a separate review. The 42 comparative experimental reports were analyzed for this review.

The 42 reports of comparative experimental studies were coded initially by research design characteristics, independent variable design and implementation characteristics, publication data, subject characteristics, teacher/director characteristics, dependent variables, and available statistical data. Appendix A contains a copy of the coding sheets. These data were collected to help interpret the findings of the review. Unfortunately, the research reports generally contained little information regarding research design, independent variable design and implementation, subjects, and teachers/directors. Systematic consideration of these factors was generally not possible.

Of the 42 comparative experimental reports, only 22 contained sufficient data to review using quantitative techniques.

Techniques described by Glass, McGaw, and Smith (1981) and Light and Pillemer (1984) were used to organize and analyze the data. Effect size estimates were computed for each finding in the studies selected for review. When means and standard deviations were provided, the effect size of a finding was computed as follows: $ES = (\bar{X}_{exp} - \bar{X}_{ctrl})/s_{ctrl}$. This effect size value describes the relationship between the experimental group mean and the control (or comparison) group mean in standard deviation units of the control group distribution. For example, an effect size of +1.0 indicates that the mean of the experimental group is one standard deviation higher than the mean of the control group.

Glass, McGaw, and Smith (1981, chapter 5) present statistical techniques for computing effect sizes when more than two groups are being compared and in some cases where means or standard deviations are not reported. For example, if a test statistic (e.g., t) is reported with treatment group n_s , an effect size can be generated as follows: $ES = t(1/n_s) + (1/n_c)$. Also, analysis of variance tables sometimes contain data that can be transformed into effect sizes. Unfortunately, nearly half the research reports did not contain sufficient data to compute effect sizes.

An effect size index provides a means of describing the magnitude of a phenomenon and facilitates comparing the results of several studies. However, interpreting the meaning of an effect size is somewhat arbitrary. Cohen (1977) recommended some conventions for interpreting effect sizes. Effect sizes ranging around .2 are small; those ranging around .5 are medium; those ranging around .8 and higher are large. They can be described as the percentage of the experimental subjects that exceed the mean of the control group. For example, an effect size of 1.0 indicates that 84% of the experimental subjects exceeded the mean of the control group. The following statistics indicate the percentage of the experimental group which exceeds the mean of the control group for the benchmark effect sizes: 79% for $ES = .8$; 69% for $ES = .5$; 58% for $ES = .2$. Such conventions are useful, but the practical and scientific meaning of an effect size depends on the implications of a finding for work in a particular field of study. Interpretation of effect sizes is complicated by the fact that observed effect sizes can be reduced by poor experimental control and low-quality measurement. An observed effect size might underestimate the actual effect of a treatment. Increasing experimental control and measurement quality tends to increase observed effect sizes.

In this review, an effect size was computed for each finding in the research reports. Sometimes several effect sizes in a single study were averaged and the mean effect size was used in subsequent analyses. For example, separate findings in a study of attitude toward bankers, markets, and profits were judged to be so similar in nature that they were combined.

In another study attitudes toward civic responsibility and community integration were not combined because they appeared to be conceptually distinct. Similar decisions were made regarding measures of cognitive outcomes. This type of judgement is an important one because it significantly affects mean effect sizes for variables of interest and the impact on a review of a single study with several findings. These judgments must often be made with little information.

Findings

Two of the experimental studies used untreated control groups to assess the instructional impact of simulation gaming. Four others compared measures of the dependent variables before and after the use of simulation games. These studies (see Table 1, studies 1-6) do not provide comparative information but they do present estimates of simulation gaming's instructional impact. For the sake of this analysis, the pre/post and the experimental/no treatment designs are analyzed together.

Three studies examined immediate recall of knowledge (IMM K). The mean effect size was .43 indicating that 67% of the simulation gaming experimental group subjects scored above the mean of the untreated control groups (\bar{X}_c). Three studies produced a .27 mean effect (60% > \bar{X}_c) for application of knowledge (APP). Livingston (1972) assessed attitude toward the subject (ATT SUBJ) and observed a mean effect of .22 (59% > \bar{X}_c). Four studies detected a .80 mean effect (79% > \bar{X}_c) for attitude toward social phenomena (ATT PHEN). Livingston (1972) observed a .29 effect (61% > \bar{X}_c) on sense of political efficacy (ATT SELF). Kidder and Guthrie (1972) measured ability to apply behavioral modification techniques (INTR) and observed an effect of .89 (81% > \bar{X}_c). In summary, these studies, although few in number, support the belief that simulation gaming does produce small to moderate effects on participants' cognitive learning and small to large effect on participants' affective learning when compared to untreated subjects. They also provide a context for thinking about the comparative effects to be described next.

Sixteen studies compared the instructional effects of simulation gaming and other instructional techniques (Table 1, studies 7-22). For immediate recall of knowledge (IMM K), the mean effect size was .12 (55% > \bar{X}_c). For retention of knowledge (RET K), the mean effect size was .28 (61% > \bar{X}_c). Combining the two knowledge variables produced an overall mean effect of .18 (57% > \bar{X}_c), a small positive effect using Cohen's conventions. Only one study (Anderson, 1970) investigated application of knowledge (APP) which resulted in a small effect of .10 (54% > \bar{X}_c). Overall, simulation gaming produced greater cognitive learning to a small degree when compared with other instructional techniques.

The set of affective outcomes from the studies are surprising. Regarding attitude toward the subject (ATT SUBJ), only four findings were generated

Table 1
Effect Sizes By Study

STUDY	COMP GRP	ATT SUBJ	ATT PHEN	ATT SELF	IMM K	RET K	APP	INTR	CLIM
1. Barkley & Dickinson (1974)	PRE/POST		.23		.35				
2. Foster, et al. (1980)	PRE/POST				.78		.20		
3. Kidder & Guthrie (1972)	NO TRT						.55	1.33	
							.24	.44	
4. Livingston (1972)	PRE/POST	.17	.71	.11 pe					
		.27	1.76	.46 pe					
5. Poppenhagant & McArdle (1981)	PRE/POST		1.15						
6. Sharan & Colodner (1976)	NO TRT		.15		.15		.10		
7. Brenenstuhl (1975)	ALT-L		-.66			.15			
8. Fowlkes (1977)	ALT-L		-.55						
9. Hegarty (1975)	ALT-L		.53						
			.41						
10. Heinkel (1970)	ALT-L				-.43	.87			

11. Henderson & Foster (1976)	ALT-L					-.06		
12. Hsiao (1975)	ALT-L					.27		
13. Jackson (1979)	ALT-L	.38	-.34	-.06 pe			.59	.64
			-.46	-.20			-.34	
			.35					
14. Szafran & Mandolini (1980)	ALT-L					-.11		
15. Vogel (1973)	ALT-L			.26 pe				
16. Wentworth & Lewis (1973, 1975)	ALT-L	-.20	-.20			.08		
17. Alley & Gladhart (1975)	ALT			.21				
18. Anderson (1970)	ALT					-.11	.02	
							.17	
19. Boseman & Schellenberger (1974)	ALT	-.12						
20. Jackson (1979)	IRG	.57	-.42	-.01			.53	-.04
			-.35	-.16			-.15	
			.28					
21. Lester & Stoil (1979)	ALT					.30		
						.64		
22. Stembler (1975)	ALT					.48		

(two positive and two negative). The mean effect size for simulation gaming compared to other instructional techniques was .16 (56% > \bar{X}_c), an overall small positive effect. For attitude toward social phenomena (ATT PHEN), 11 findings were produced (four positive and seven negative). The mean effect size was $-.13$ (44% > \bar{X}_c), a small negative effect favoring the alternate instructional techniques. For attitude toward self (ATT SELF), six findings (two positive and four negative) resulted in a mean effect size of .01, essentially no differential effect. Two studies reported by Jackson (1979) reported two findings regarding classroom climate, a very small negative effect and a moderate positive effect ($\bar{X}_{ES} = .30$).

Ten of the 16 studies which compared the effects of simulation gaming with other instructional techniques examined alternate treatments which were predominantly lecture-oriented. The mean effect size for immediate recall of knowledge (IMM K) was $-.05$, essentially no differential effect. The mean effect size for retention of knowledge (RET K) was .32, a small to moderate positive effect (63% > \bar{X}_c). These findings are consistent with the hypothesis that simulation gaming is no more effective than lecture in the short-run, but that simulation game participants tend to remember what they learn longer than students who learn through lecture.

The set of affective findings for lecture-oriented studies is similar to the previously discussed larger set of alternate instruction studies. The overall effect for attitude toward the subject (ATT SUBJ) was .09 (54% > \bar{X}_c). The mean effect for attitude toward social phenomena (ATT PHEN) was $-.13$ (45% > \bar{X}_c). The mean effect size for attitude toward self (ATT SELF) was 0.0. One study (Jackson, 1979) examined classroom climate (CLIM) and produced an effect size of .64. With the exception of classroom climate (CLIM), the differential attitudinal effects of simulation gaming and lecture are negligible to small. Simulation gaming has a slight advantage for attitude toward the subject (ATT SUBJ); lecture has a slight advantage for attitude toward social phenomena (ATT PHEN).

Simulation game design features are probably very important regarding attitude development. It seems likely that the model underlying a political simulation game could promote a sense of political efficacy or undermine it depending upon how much control participants are given over the simulation game outcomes. Wentworth and Lewis (1973b, 1975) observed that lecture produced more favorable attitudes toward market phenomena and less favorable attitudes toward command economies than did simulation gaming. It is possible that a simple simulation game model allowed an unrealistically high degree of control for the decision makers that would make command economies appear more feasible than they would in a market-oriented series of lectures. The studies analyzed here do not provide sufficient information even to begin the clarification of the design factors affecting attitudes.

Six data sets reported in seven articles focused on economics (Anderson,

1970; Boseman & Schellenberger, 1974; Brenenstuhl, 1975; Hegarty, 1975; Hsiao, 1975; Wentworth & Lewis, 1973b, 1975). Eight studies in seven articles focused on political science (Alley & Gladhart, 1975; Fowlkes, 1977; Heinkel, 1970; Henderson & Foster, 1976; Jackson, 1979; Lester & Stoil, 1979; Vogel, 1973). Although the findings are few and must be interpreted very tentatively, there are some interesting contrasts. Simulation gaming was more effective than alternate forms of instruction at promoting positive attitudes toward political science ($\bar{X}_{ES} = .48$) than toward economics ($\bar{X}_{ES} = -.16$). However, simulation gaming compared to alternate instruction produced greater effects on attitudes toward economic phenomena ($\bar{X}_{ES} = .25$) than toward political phenomena ($\bar{X}_{ES} = -.27$). For knowledge outcomes (IMM K, RET K), simulation gaming was more effective than alternate instructional techniques but relatively more effective for political science ($\bar{X}_{ES} = .22$) than for economics ($\bar{X}_{ES} = .10$). There is no information in the studies to suggest why there might be differential instructional effects in various subject matter areas.

Discussion

This quantitative review involved computing effect sizes for the findings of studies and describing the results of sets of related studies in terms of those effect sizes. As noted previously, only about half of the relevant reports contained enough data to compute the effect sizes. The other studies were not included in the quantitative review. Table 2 presents the results of the statistical significance tests reported in the entire set of 42 studies. All findings reported by the authors are indicated with a + for statistically significant in favor of simulation gaming, - for statistically significant in favor of alternate instructional techniques, or 0 for no statistically significant difference. The findings of a vote count of statistical significance tests and the previously presented effect size analyses were compared.

For attitude toward the subject (ATT SUBJ), there were four statistically significant findings in favor of simulation gaming and four findings of no statistically significant differences. These findings could be viewed as weak evidence for a positive differential effect for simulation gaming. The effect size analysis supports the hypothesis that simulation gaming is slightly more effective ($\bar{X}_{ES} = .16$) than alternate instructional techniques at producing positive attitudes toward the subject matter.

For attitude toward social phenomena (ATT PHEN), there were 8 findings favoring simulation gaming, 4 findings favoring alternative techniques, and 13 findings of no statistically significant differences. These findings tend to support the belief that there is no differential impact. However, the effect size analysis supports the hypothesis that simulation gaming is slightly less effective ($\bar{X}_{ES} = -.13$) than alternate instructional techniques at affecting attitude toward social phenomena.

For attitude toward self (ATT SELF), there were four findings favoring

Table 2
Statistical Significance Tests By Study

STUDY	COMP GRP	ATT SUBJ	ATT PHEN	ATT SELF	IMM K	RET K	APP	INTR	CLIM
Barkley, et al. (1974)	PRE/POST		○		+				
Boocock, et al. (1966)	PRE/POST		+	+					
Cherryholmes (1966)	PRE/POST		○						
			+						
Dunlop (1979)	PRE/POST		++++++						
			++++++						
			++○○						
			○○○○						
Feldbaum (1976)	PRE/POST		++++						
			+○○	+	+				
Foster, et al. (1980)	PRE/POST				++			+	
					+○			○○	
Groome (1975)	NO TRT				○				
Kidder, et al. (1972)	NO TRT						○	+	
							○	○	
Livingston, et al. (1972)	PRE/POST	○	+	○					
Louscher . . . (1977)	PRE/POST		+		○				
Plummer (1982)	PRE/POST								+
Poppenhagen, et al. (1981)	PRE/POST		+						
			+						
Sharan, et al. (1976)	NO TRT		+○		+++		++		
					○○		○○		
Targ (1975)	NO TRT		+	○					
			+	○					

Bredemeier . . . (1982)	ALT-L		-		○				
			+		-				
			-						
Breneustuhl (1975)	ALT-L	+						○	
								○	
								○	
Combs . . . (1976)	ALT-L		○			○			
						+			
Fennessey . . . (1974, 1975)	ALT-L		○			○			
Fowlkes (1977)	ALT-L		-						
			-						
Hegarty (1975)	ALT-L		+						
			○						
Heinkel (1970)	ALT-L	+				○		○	
Henderson, et al. (1976)	ALT-L					○			
Hsiao (1975)	ALT-L					○			
Jackson (1979)	ALT-L	○	○		○			+	○
			+		○			○	○
			○						
Keating (1979)	ALT-L								
Szafran, et al. (1980)	ALT-L					○			
						○			
Vogel (1973)	ALT-L				+				
Wentworth, et al. (1973, 1975)	ALT-L	○	+	○					
			○	○					
			○	○		○			
Wing (1966)	ALT-L					○		○	
						+		○	

Table 2 (continued)

STUDY	COMP GRP	ATT SUBJ	ATT PHEN	ATT SELF	IMM K	RET K	APP	INTR	CLIM
Alley (1975)	ALT			○					
Anderson (1970)	ALT				○	○ ○			
Boocock (1966)	IRG		+	○○ ++					
Boocock (1967)	IRG		+						
Boseman, et al. (1974)	ALT	○							
Chartier (1972)	ALT				○ ○		○○ ○○		
Jackson (1979)	IRG		○ ○ ○	○ ○		+○ ○○ ○			
Johnson . . . (1972)	ALT					○ - ○	○ +		○
Lee . . . (1971)	ALT	+	+ ○	+					
Lester, et al. (1979)	ALT				○ + +				
Lindblad (1973)	ALT-L						+		
Livingston, et al. (1972)	IRG	○	+	○					
Stembler (1975)	ALT				+				

simulation gaming, one finding favoring alternate instructional techniques, and nine findings of no statistically significant differences. These findings are evidence of equal effectiveness for simulation gaming and alternate instructional techniques. The effect size analysis also supports the hypothesis of no differential effect ($\bar{X}_{ES} = .01$).

For short-term recall of knowledge of facts, concepts, and generalizations (IMM K), there were 5 findings favoring simulation gaming, no findings favoring alternate instructional techniques, and 13 findings of no statistically significant differences. These findings are consistent with the hypothesis of no differential impact. However, the effect size analysis supports the hypothesis of a small positive effect favoring simulation gaming ($\bar{X}_{ES} = .12$) compared to alternate techniques, but no differential effect when compared to lecture only ($\bar{X}_{ES} = -.05$).

For retention of knowledge (RET K), there were 2 findings favoring alternate instruction and 15 findings of no statistically significant differences. These findings support the belief that there is no differential impact. However, the effect size analysis supports the hypothesis that simulation gaming has a small positive effect ($\bar{X}_{ES} = .18$) over alternate instructional techniques and a larger effect when compared with lecture only ($\bar{X}_{ES} = .32$). There are insufficient data to make similar comparisons for the other dependent variables.

One explanation for these differences lies in the major loss of information which occurs when the focus is on statistical significance testing. If the statistical power of a study is low, the larger an observed effect must be in order to achieve statistical significance when tested (VanSickle, 1983). The smaller the observed effect, the greater the statistical power needed to detect it. When statistical power is inadequate, an observed effect often becomes a statistically nonsignificant effect which is usually interpreted no differently than a zero effect. Also, the magnitudes of statistically significant effects are invisible; the distinction is only between no effect and some effect. Vote-counting methods accept this loss of information while effect size analyses attempt to retain more of the available information.

Another explanation for the differences between the conclusions of a vote-counting method and a quantitative lies in measurement problems. One possible reason that observed effects are small is that the measurement instruments are unreliable or invalid. Poor quality measurement tends to attenuate observed effects (VanSickle, 1986). The data reported in the 42 research reports of this review cast grave doubt on the quality of the measurement instruments used in them. Indicative of the lack of concern for instrument quality is the frequent absence of any information regarding the quality of the instruments, with 69% providing no information at all about reliability or validity and 12% presenting only scant information. Given the absence of information and the off-handed way instrumentation was discussed in many of the reports, it seems probable that the measure-

ment procedures used in most of the studies were of low quality. It also seems probable that effects reported in the studies were often underestimated. The modest differential instructional impacts might be considerably greater than described in this review. Measurement inadequacies make the retention of effect size information even more desirable.

It is also interesting to compare the results of the nine prior reviews of the instructional effects of simulation gaming with this quantitative review. The majority view was that simulation gaming and other instructional techniques are equally effective in teaching short-term recall of knowledge (IMM K) and retention of knowledge (RET K). This quantitative review was consistent with this conclusion regarding short-term recall (IMM K) for lecture but not for alternate instruction generally. Also, the findings of this review support the hypothesis that simulation gaming participants tend to remember what they learn longer than students who learn through alternate forms of instruction. For attitude toward the subject matter (ATT SUBJ), the reviews tended to support the hypothesis that simulation gaming was more effective; this quantitative review supported a small positive effect. For attitude toward social phenomena (ATT PHEN), most of the prior reviews favored simulation gaming while the effect size review favored the alternate instructional techniques. Explanations for the differences can only be hypothesized: (1) Some prior reviews examined smaller sets of research reports; (2) Too much attention might have been given to statistical significance tests.

This quantitative review is subject to two severe qualifications. First, 68% of the studies for which effect sizes were computed involved subjects who were of college age or older. Students in the middle and secondary school grades might respond to stimulation gaming treatments differently than college students. There was an insufficient number of studies to compare the two groups.

Second, this review includes only published journal articles. The advantage is that at least some quality control efforts were made before they were published. In some fields of inquiry, however, publication bias in favor of statistically significant studies has been observed (Light & Pillemer, 1984). One simulation gaming review (Dekkers & Donatti, 1981) claimed that publication bias existed in this field of study. Unfortunately, no data other than a correlation coefficient was reported to substantiate the claim. In this review, two-thirds of the studies for which effect sizes were computed contained at least one statistically significant finding. However, 63% of the findings reported by the authors were not statistically significant. The possibility of publication bias needs to be investigated empirically.

Further needed research is an investigation of the simulation gaming design literature. It was uncommon to find detailed descriptions of the simulation gaming or alternate instructional treatments used in the comparative experimental studies. Consequently, this review of the effects of

simulation gaming addresses the effects of very coarsely categorized independent variables. A review of the other set of 49 experimental studies of the effects of design features on participant outcomes could clarify some issues in the comparative reviews. Such a review could also outline useful ways of defining the nature of adequately designed instructional simulation games.

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Appendix A

STUDY _____

RESEARCH DESIGN

- _____ 1. low quality measurement?
- _____ 2. nonschool setting?
- _____ 3. designer-experimenter?
- _____ 4. history threat?
- _____ 5. testing threat (pretest)?
- _____ 6. regression threat?
- _____ 7. differential selection of subjects for treatment?
- _____ 8. differential mortality?
- _____ 9. reactive arrangements (Hawthorne effect)?
- _____ 10. sample size?
- _____ 11. comparison group experience? (no treatment, alternate instruction, irrelevant game experience)

INDEPENDENT VARIABLE

- _____ 12. clear instructional objectives?
- _____ 13. preplay preparation/instruction?
- _____ 14. coaching during play?
- _____ 15. structured discussion during play?
- _____ 16. debriefing prior to measurement?
- _____ 17. correlated instruction?
- _____ 18. presentation or application purpose?
- _____ 19. subject matter/content area?
- _____ 20. size of playing unit?
- _____ 21. length of play?
- _____ 22. number of rounds?
- _____ 23. role specific or general?
- _____ 24. cooperative, competitive, or cooperative within/
competitive without (c/c)?

PUBLICATION DATA

- _____ 25. year published, presented, issued?
- _____ 26. journal, book, unpublished paper?

SUBJECT CHARACTERISTICS CONSIDERED

- _____ 27. age/grade?
- _____ 28. academic/verbal ability?
- _____ 29. cognitive style?
- _____ 30. sex?
- _____ 31. emotional characteristics?
- _____ 32. socio-economic status?
- _____ 33. ethnicity?
- _____ 34. predisposition toward game playing?

TEACHER/DIRECTOR CHARACTERISTICS CONSIDERED

- _____ 35. experience in/attitude toward simulation games?
- _____ 36. length of teaching experience?
- _____ 37. sex?

DEPENDENT VARIABLES MEASURED

- _____ 38. student attitude toward the subject matter/learning?
- _____ 39. student attitude toward social phenomena?
- _____ 40. student attitude toward self?
- _____ 41. knowledge of simulation game model?
- _____ 42. knowledge of facts, principles, and concepts?
- _____ 43. skill in analyzing analogous new situations?
- _____ 44. skill in decision making (what to do)?
- _____ 45. skill in interacting with other people?
- _____ 46. climate of teacher-student relationships/interaction?
- _____ 47. climate of peer relationships/interaction?
- _____ 48. game play performance?
- _____ 49. teacher characteristics?

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